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COMPUTERWORLD

CA cuts Unicenter cost

By Thomas Hoffman
and Rosemary Cafasso

In a dramatic reaction to the demands of smaller buyers, Computer Associates International, Inc. last week slashed the prices of its CA-Unicenter systems management packages by up to 86%.

The price breaks on the software are intended to reduce the entry point for low-end Unix systems shops while providing volume discounts on power-based pricing for mainframe-class Unix machines — particularly for firms with mixed hardware platforms (see chart). The move could help CA strengthen its position in the nascent distributed systems management market, which is expected to swell to $5 billion by 1998, according to Gartner Group, Inc. in Stamford, Conn.

Pricing plummet

Computer Associates' price cuts on its CA-Unicenter are expected to generate new business from small to medium-size accounts

Model	Old price	New price	Savings
RS 6000 [illegible]	$75,600	$24,600	68%
Sun Server 1040	$68,600	$12,000	83%
HP 9000 [illegible]	$60,200	$14,400	76%
DG AV 5500	$56,000	$8,400	85%
NCR 3445	$42,000	$5,900	86%

While the price cuts are aimed at new customers, current Unicenter users will be given an opportunity to rework their licenses to take advantage of the discounts, said Kurt Seibert, CA's senior vice president of strategic planning. Yet because many of these larger customers already receive volume discounts through CA's enterprise licensing agreements, the impact of the new pricing on the installed base is expected to be minimal, users and analysts agreed.

"I probably won't pursue a rebate with CA on Unicenter. I'm very happy with the pricing I got," said Sam Ellis, associate vice president of information services at Portland Community College in Portland, Ore., which has been using

CA, *page 133*

Lotus shifts app priorities

Poor earnings spur revamp

By William Brandel and Lynda Radosevich

Reeling from a disappointing second-quarter performance, Lotus Development Corp. has entered yet another round of broad-based restructuring to shore up flagging desktop applications and international sales.

The company is making the following changes:

- Discontinuing further core development of its DOS product lines, with the exception of CC:Mail for DOS.
- Ceasing further development of versions of 1-2-3 for Unix.
- Freezing hiring and major purchases.
- Realigning its senior management.

Just three months ago, Chairman Jim Manzi assured an audience at Lotus annual meeting that there would be "no more talk of transitions." Yet ninting Lotus 36% drop in earnings this quarter analysts said the company has no choice but to change

Plans for troika

Lotus said it is considering further management changes to consolidate the company into three distinct divisions: desktop applications, communications and services.

In addition, a spokesman confirmed that a series of off-site management meetings were held last week to discuss further changes that would consolidate the new executive-level shuffle.

Should the reorganization work as planned, a leaner, more strategically focused Lotus would be able to deliver products internation-

Lotus, *page 133*

Service unit ramps up for Chicago intro

By Stuart J. Johnston
and Mark Halper

Microsoft Corp. executives say it won't happen again.

With previous systems software releases, Microsoft has taken a drubbing for technical support snafus, such as jammed phone lines and long waits on hold. It has vowed circumstances will be different when Chicago finally ships early next year.

With Chicago, the next major release of Windows, Microsoft is making aggressive plans to have plenty of phone lines and support personnel lined up to handle the inevitable surge of technical support calls.

Circuits are busy

Company officials declined to say how many support calls specifically concern Windows, but Deborah Willingham, vice president of

Chicago, *page 14*

Video games toy with networks

'Playware' can spell doom for strained resources

By Stephen P. Klett Jr.

When Ted Lilley's PC started acting sluggish last December, he investigated the problem and found a nasty surprise.

As the manager of his dormitory network at Harvey Mudd College in Claremont, Calif., Lilley discovered that his troubles could be traced to Doom's doorstep. The network game Doom, that is.

Lilley had noticed slow response times from his 386 and keystrokes being dropped every few letters. He tracked the problem to

Video games, *page 12*

Analysts estimate lost productivity from playing computer games in offices has reached $300 billion a year. At left is Doom, a popular network game.

Outsourcing partnerships

Delta flies with AT&T

By Mark Halper and Ellis Booker

Hoping to save some $400 million over the next 10 years, Delta Air Lines last week reached a preliminary $2.8 billion outsourcing accord with AT&T Global Information Solutions.

Delta Chairman Ronald Allen *says the airline will provide the bulk of the 1,200 IS staff members needed for the joint venture*

In a variation on traditional outsourcing arrangements, the two announced plans to form a 50/50 partnership company that — along with managing the lion's share of Delta's data processing and data communications — will seek other transportation industry customers.

Delta Chairman Ronald Allen said the anticipated savings will come from cost reductions and improved productivity that should result from outsourcing. However, neither Allen nor AT&T GIS officials would speculate on how much money the joint venture could generate.

Delta, *page 16*

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What's Inside

August 29, 1994

The CW Guide to Midrange Systems

SPLIT DECISION

Should you switch to Unix from installed systems? The answer is yes, no and maybe. Yes, if you are in a hurry to get into open systems. No, if you can wait. Maybe, if your vendor is moving away from its traditional platform. Three experts and our Buyers' Satisfaction Scorecard survey on HP, IBM and Digital will help you sort out the options ☞ *Starts on page 77*. Also, Firing Line features Digital's Alpha 2100 ☞ *Page 102*. And Marketplace spotlights residual values of major systems ☞ *Page 123*.

NEWS

■ **Novell's** earnings drop below analysts' projections. *Page 4*

■ **Powersoft** unveils plans to push into high-end development. *Page 6*

■ Novell plans interfaces that will let its **Tuxedo** transaction monitor interoperate with DCE installations. *Page 8*

■ The next major release of **SCO Unix** will have a high degree of integration with Windows. *Page 10*

■ Reports of Digital's sale of **Rdb** to Oracle resurface. *Page 12*

■ IBM responds to Compaq's PC **price cuts**, while other vendors reportedly line up to follow suit. *Page 14*

■ SAP plans several boosts to client/server software and gets cozier with Microsoft. *Page 15*

■ **Standards bodies** will build a network of distributed standards databases. *Page 28*

COMPUTER INDUSTRY

■ IBM will meld **Metaphor** into two different IBM divisions. *Page 35*

DESKTOP COMPUTING

■ Software Publishing Corp.'s **Harvard Graphics** package battles the dominance of office suites sellers Microsoft and Lotus. *Page 45*

WORKGROUP COMPUTING

■ **AT&T** sets its sights on growth in the NT server market. *Page 49*

ENTERPRISE NETWORKING

■ Users acknowledge there are **security risks** on the Internet but don't agree on solutions. *Page 55*

LARGE SYSTEMS

■ Hitachi Data Systems and Amdahl try to regain their positions at the front of the pack in **mainframe storage**. *Page 63*

APPLICATION DEVELOPMENT

■ **Texas Instruments** takes a step toward enterprisewide client/server development by opening up its proprietary IEF CASE tools and repository. *Page 67*

MANAGEMENT

■ When outdoor clothing company Patagonia decided to shake out the cobwebs and closely align business and IS, it hired a 31-year-old nontechnologist to lead its IS ranks. *Page 72*

CAREERS

■ Working in IS is a great way to make a living, according to a recent *Computerworld* poll, though opinions vary on who has the best job. Top honors go to CIOs and vice presidents, while systems security and telecommunications managers ranked nine and 10, respectively. *Page 113*

MARKETPLACE

■ Check out the **residual value forecasts** for select IBM, Hewlett-Packard and Digital machines. *Page 123*

COMMENTARY

■ **Charles Babcock** says Apple needs to make multimedia work if it wants to find a new way into the corporate world. *Page 6*

■ **Bill Laberis** says yes, there are benefits to client/server, and yes, you should go ahead with it, but there are limits and potholes. *Page 36*

■ **Joe Maglitta** discovers that there are information technology lessons to be learned from Woodstock. *Page 37*

■ **Michael Schrage** warns that groupware pioneers "ain't seen nothin yet." *Page 37*

■ **Susan Braden** says U.S. antitrust laws have stood the test of time and still work. *Page 41*

■ **Jonathan Bines** passes along client/server facts your vendors forgot to tell you. *Page 41*

■ **Paul Gillin** takes a look at some up and coming groupware technology. *Page 53*

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Executive Briefing

IS account managers are finding that the middle ground between IS and users can be a hotbed of distrust and fear. To succeed, says John Seral, vice president of information technology at GE Capital Auto Financial Services, they need strong business, IS and communications skills and very thick skin. *Page 69*

Delta Air Lines hopes to save some $400 million over the next 10 years through a $2.8 billion outsourcing agreement with AT&T Global Information Solutions. But the Delta deal is more than an outsourcing contract. AT&T and Delta also plan to work as partners to provide computing services to other transportation industry customers. In addition, Delta will outsource its mainframe-based reservation system to the Worldspan reservation consortia, in which Delta has previously been a partner. *Page 1*

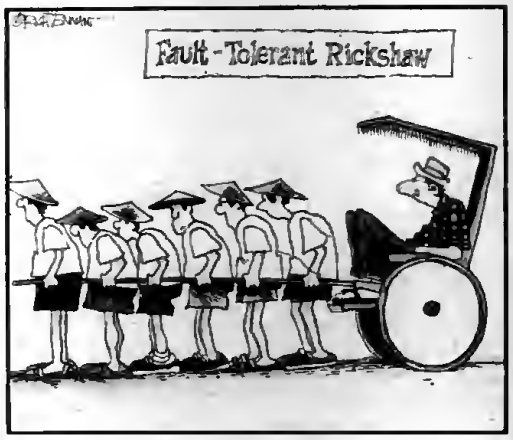
Microsoft promises it won't make the same mistake twice, vowing to upgrade its technical support infrastructure before Windows 3.1 successor Chicago ships to users next year. Microsoft endured broad criticism during past major software releases because of jammed telephone lines and long waits by users. *Page 1*

As the corporate downsizing trend continues, age discrimination and other wrongful termination lawsuits involving IS employees have risen dramatically, as evidenced by a recent age discrimination case involving three former consultants at New York software developer JYACC, Inc. *Page 28*

To license programmers or not to license programmers? Should programmers be held accountable for damages when their systems go bad? These are the questions facing IS professionals and government regulators. In a "Soundoff" debate, the pros and cons of licensing are aired. *Page 106*

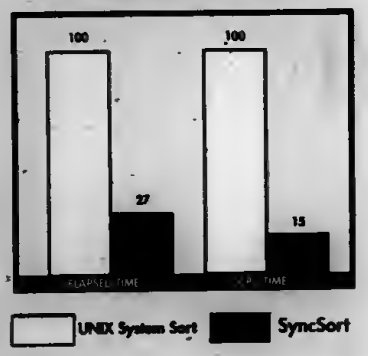
Relief may be on the way for corporations frustrated by backlogs in popular portable computer lines, particularly high-end color notebooks. IBM and other major vendors expect to ease the supply problems in the fourth quarter of this year. *Page 4*

The 5th Wave *by* Rich Tennant



The UNIX System Sort

PERFORMANCE



FUNCTIONS

	UNIX System Sort	SyncSort
RECORDS FORMATS		
Fixed length binary	NO	YES
Variable length binary	NO	YES
ASCII Text	YES	YES
RECORD PROCESSING		
Selection	NO	YES
Reformatting	NO	YES
Summarization	NO	YES
Grouping	NO	YES
COLLATING SEQUENCES		
Standard ASCII	YES	YES
EBCDIC	NO	YES
User Defined	NO	YES
Multi-byte	NO	YES

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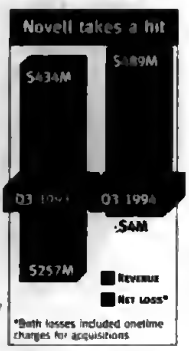
UNIX

Novell earnings fall, staff cuts on way

By William Brandel and Lynda Radosevich

In an effort to gain control over costs, Chairman Robert Frankenberg last week said he will cut more than 1,750 employees from the combined operations of Novell, Inc. and its WordPerfect subsidiary. But staff cuts are not enough for users and analysts, who said they want Frankenberg to gain control over product deliveries and straighten out Novell's strategy while he's at it.

In addition to the 1,100 jobs that will be cut before Oct. 30, Novell told analysts in a briefing last week that it would eliminate another 650 people — mostly from redundant manufacturing efforts — in the first quarter of 1995. Analysts added that Novell plans to contract with many of those terminated 650 employees.



Cutting away

Most of the cuts are expected to come from WordPerfect, analysts said, noting that WordPerfect's revenue per employee is about half of Novell's. Ad Rietveld, president of WordPerfect, said the split would be about 60/40 between the two companies. But he said he did not know which side would experience the bulk of the cuts.

Frankenberg's announcement came after last week's posting of a net loss of $4 million for Novell's third quarter, compared with a loss of $257 million for the same quarter in 1993. The loss came less than one week after Novell told analysts to expect results 20% lower than the previously projected 25 cents per share.

The loss was attributed mainly to a onetime charge related to the acquisitions of WordPerfect and the Quattro Pro spreadsheet from Borland International, Inc. Excluding the charge, Novell would have posted a profit of 21 cents per share, or $77 million.

"The fact is that Novell would not have had a great quarter even without the WordPerfect acquisition," said William Becklean, an analyst at Hancock Institutional Equity Services in Boston. Becklean said flat NetWare 3.12 sales and anemic NetWare 4.02 sales resulted in disappointing third-quarter profits.

Will service suffer?

Users eyeing the cuts expressed reservations about the impact on the combined Novell/WordPerfect service strategy.

"I'm not convinced that all the cuts are duplicates, and with reductions that deep, there is definitely going to be a reduction in responsiveness and timeliness," said Richard Mellor, data processing manager for the Harford County government in Bel Air, Md.

"Novell support is lousy. It's always been lousy," said Kenneth Orme, an information systems manager at the Unisys Government Systems Group, a defense contractor in Salt Lake City. "Until they realize there are real human beings on the other side of the phone line, I don't know how they are going to survive. Now that they've taken on word processing, Novell has to change that."

Rietveld said Novell was responding to these users' concerns. For starters, he said WordPerfect people will be in charge of the combined support organization. "It's not like the the Novell support model is being pushed on WordPerfect. The WordPerfect model will be extended into the Novell side. Novell recognizes ... what an important marketing tool that it has been."

Beyond any advantages gained in the support area, the five analysts contacted for this story were unanimous in saying that the Novell/WordPerfect merger does not make sense. They cited Microsoft Corp.'s entrenched position in the suite market, the lack of synergy between Novell and WordPerfect and the impact on Novell's bottom line of trying to absorb WordPerfect.

"The bigger question is: What is their strategy?" said Rich Edwards, an analyst at Robertson Stephens.

One week before the earnings announcement, Novell reduced earnings expectations, attributing the shortfall to disappointing earnings derived from the Quattro Pro and WordPerfect product lines. Analysts said Novell officials refused to answer questions regarding which specific products had dragged down revenue.

Product deliveries

Analysts attributed the last-minute earnings change to the complexity that Novell is now facing in trying to downsize costs, integrate functions and deliver already-late products at the same time a new chief executive officer tries to assume control.

Regarding those products, Novell officials told analysts that it would ship the long-awaited NetWare 4.1 by Dec. 31 and that it would ship AppWare, its application programming platform, in the first quarter of 1995. If Novell meets these new projections, each product will be more than six months late.

The company said it would also ship the new applications suite based on WordPerfect, PerfectOffice, by the end of October. The product was announced in June but will not enter beta testing until next week.

Manufacturers vow end to color notebook backlog by '95

By Michael Fitzgerald

The seemingly infinite loop of color notebook backlogs is about to be broken, starting with serial offender IBM PC Co.

Users can expect to get some relief in the fourth quarter, as IBM and other notebook makers start to leverage increased capacity at existing flat-panel manufacturers and new suppliers that have entered the market for thin film transistor active-matrix color screens.

Despite these changes, analysts suspect the backlogs may not go away until the first quarter of 1995.

Thin film transistor color screens have been in short supply almost from the time they were introduced, with backlogs primarily at the biggest notebook makers — IBM, Toshiba America Information Systems, Inc. and Compaq Computer Corp. An extremely complex manufacturing process has kept yields low and forced most users who wanted color notebooks to wait or use passive-matrix color.

Coming to an end

"Obviously, [the end of backlogs] is a good thing," said Ann Wyszynski, a senior buyer at Dow Jones & Co. in Chicopee, Mass. She said her company wants active-matrix color notebooks, but "we've had to settle for less than active-matrix or go to an alternate brand." Dow Jones buys primarily from Compaq, Toshiba and AST Research, Inc.

But yields have improved from 30% to 60% industrywide, according to Andrew M. Seybold, editor in chief of "The Outlook on Mobile Computing," a newsletter in Brookdale, Calif.

For information systems managers who have waited as long as six months to get notebooks with active-matrix color screens, the end of the supply nightmare is good news. For example, it should mean fewer headaches from delayed projects and angry end users who are waiting for their notebooks.

Impossible wait

Backlog relief "would be great news," said an IS manager at a large financial services firm in New York. The manager, who requested anonymity, said his company waited two to three months for high-end active-matrix color notebooks from Toshiba and Compaq, adding that IBM "was impossible." He said his company was preparing to shift its orders to NEC Technologies, Inc. because it is generally able to meet demand.

Overall, the notebook supply backlog "is creating problems for us," the IS manager said. "Users check with you periodically, and what does it look like when you can't tell them anything?"

More important, however, the end to backlogs should also mean the beginning of lower prices on high-end notebooks, which have reached the mid-$6,000 mark. But analysts do not expect prices to fall much more than 10% on the high end because most vendors will likely add features and keep pricing high.

Analysts also said the breakthrough in active-matrix color supply will help complete a radical shift in the notebook market from monochrome to color.

"This is a huge shift, and it's washing across the spectrum of vendors, not just the big guys, said Bruce Stephen, an analyst at International Data Corp. (IDC) in Framingham, Mass. IDC expects color notebooks will make up more than two-thirds of all notebook sales in 1994.

Looking ahead

For IBM, catching up with its ThinkPad backlogs would be a spot of bright news in what has become a dismal year for the company in the PC market. IBM is widely seen as having lost the most notebook business because of backlog problems.

Executives at the PC Co. have been promising customers that their backlog nightmares will end before the year does. Driving this prediction are increased capacity at IBM's Display Technologies, Inc. (DTI) joint venture with Toshiba Corp., a new supply of 8.4-in. color screens from Sharp Corp.'s Camas, Wash., facility and additional active-matrix color screens of various sizes from at least two unannounced suppliers.

Users should see supplies improve starting with the October announcement of a minor upgrade to the ThinkPad 755 series, IBM officials said.

An IBM official who requested anonymity read an internal document to *Computerworld* that said DTI supplied 68% of IBM's color screens last year, while this year it will supply only 38%.

"I'm going to be able to take a vacation in December," said Joseph Formichelli, general manager of IBM's ThinkPad product line. Formichelli said an additional supplier for 10.4-in. thin film transistor panels will help, though he declined to name the supplier.

Formichelli said the only thing that could derail IBM from catching up with the backlog would be if an unforeseen manufacturing problem occurs at DTI or IBM's new 10.4-in. screen supplier.

—Michael Fitzgerald

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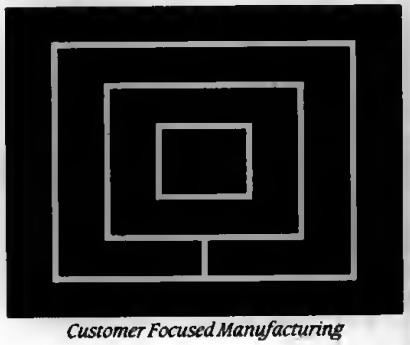

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Back door swings open for Mac

Information systems managers struggling with the incompatibilities of operating systems and hardware gained a small consolation a year ago: Apple's Macintosh had been stopped dead in its tracks in their organizations because of the success of Microsoft's Windows.

In mixed IS shops, the winnowing out of a renegade architecture is cause to rejoice, given the intricacies of technical support. The Macintosh is barely holding its own inside business organizations, but outside, it has started popping up in new places. Inside it has a niche role in graphics and desktop publishing. Outside it is expanding into multimedia applications.

"Multimedia," chuckles the IS manager, "is *not* big in the corporate setting." Multimedia systems heretofore have been dedicated processors with specialized editing software and add-on devices. The training department uses multimedia, and the readers of *Wired* over in marketing have experimented with it for presentations. But it remains of limited importance in the opinion of the IS staff.

Apple has to hope this multimedia scene plays itself out to a second chance with corporate IS.

Charles Babcock

At night, however, the IS manager goes home and watches his teenagers play with a Macintosh equipped with CD-ROM and a SCSI bus running QuickTime 2.0. With Kodak's PhotoCD, they zoom in and crop pictures of their favorite rock stars. They add the pictures to letters and imaginary documents they're sending to friends. And to finish off their compound creations, they splice in selections of music from a CD.

And Dad, the IS manager, listens with amazement as they tell him they will soon be able to generate a virtual reality setting through QuickTime VR. QuickTime VR, due from Apple before year's end, can make use of a sequence of 35mm photos to create a 360-degree setting. The viewer can zoom in or away from multiple spots in the setting, open drawers in furniture, pick up objects or just navigate around the scene. The kids hope they can buy photo sets of the Presley mansion in Memphis and a Bon Jovi performance in New York.

"By George," muses the IS manager to himself, "the boss was complaining we had no way of establishing an index of employee photo IDs for security. And he wanted to show how our assembly tools really work rather than just taking overheads to that prospect in Chicago. Hmmm. . . ."

A reputation to regain

Apple has little choice but to hope this scene plays itself out to a second chance with the IS manager. Skepticism about Apple has grown in the IS ranks since the fumbled launch of the Newton MessagePad. Apple still possesses its 10% to 11% market share in business, but that means it is being outdistanced 9-to-1 during an expansion period in which it possessed a technology lead.

So Apple must fall back on its core strength, providing the best user interface for home and educational computing. With the advent of its stepped-up Power Macintosh line, it enjoys an advantage among the multimedia authors in San Francisco and other locales. Now it must push that strength and hope it swings open the back door to IS. Apple could improve that prospect if both customers and software developers knew there was a reliable second source, a clone maker keeping Macintosh prices honest.

What if, instead of going their separate ways, Apple and IBM reached a rapprochement and derived a common architecture for their use of the PowerPC chip? They could put a single microkernel operating system on the PowerPC and Power Macintosh and snag more than 25% of the market.

But let's not drift off into virtual reality. Let's just hope Apple does not squander its second and perhaps last opportunity with the Macintosh.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

PowerBuilder to target high-end client/server

Meanwhile, CEO deals with CompuServe complaints

By Meliada-Carol Ballou

Powersoft Corp. officials last week unveiled the company's push into high-end development with a series of features intended to bolster the PowerBuilder client/server tools over the next 18 months.

Some of the high-end capabilities for PowerBuilder will be available with Version 4.0, expected next month, the officials said. These include multiplatform support and integration with a range of transaction processing monitors, as expected [CW, Aug. 15].

Meanwhile, as the company briefed the press on PowerBuilder's future features last week, CompuServe discussions raged as Powersoft Chief Executive Officer Mitchell Kertzman told users and commentators that the company would address issues of concern and to calm down.

The Powersoft forum on CompuServe has grown from about 7,500 members in February to 26 000 members

"Everyone, go take a cold shower and get back to work," Kertzman wrote in a CompuServe posting last week. "Powersoft people and Team [Powersoft] people will be focused on customer success, which is our mission. Anyone who does not share that interest should spend his time on his own customers."

Several dozen PowerBuilder developers on CompuServe have reported system crashes related to General Protection Faults during the past month, some of which were generated by bugs in PowerBuilder 3.0, the users said [CW, Aug. 22].

Company officials, however, said providing new features for scaling up applications is essential — and not incompatible with addressing problems with the current release.

They said other PowerBuilder features, which will arrive in later releases over the next year and a half, include tight integration with the Watcom compiler. This will allow for machine code compilation and the ability to generate C++ for other platforms such as Unix or Microsoft Corp.'s Windows NT.

Release 4.0 will allow developers to write C++ for Windows platforms from within PowerBuilder. The ability to create and integrate remote services using PowerBuilder will be a key feature in future releases, officials said.

Partitioning added

In an effort to fend off competition from vendors such as Forte Software, Inc. and Dynasty Technologies, Inc., Powersoft also announced support for application partitioning. Partitioning will allow developers to run portions of their PowerBuilder applications on Windows or other platforms, such as Unix or Windows NT clients or servers.

Powersoft will target team development with configuration management support, which will ship with Version 4.0.

As for problems with the current version of PowerBuilder 3.0, Powersoft officials said they will continue to improve the current release until Release 5.0.

While industry analysts applauded the new features, they said Powersoft must also address software problems in the current version. "On a couple of fronts they're doing the right things," said Donald A. DePalma, an analyst at Forrester Research, Inc. in Cambridge, Mass. "But they must continue their bug hunt."

"The ability to create C++ lets people create specialized functions — it's important," said Richard Finkelstein, president of Performance Computing, Inc., a Chicago-based consultancy.

Finkelstein added, however, that "from an engineering perspective, you cannot build on something that's rocky — you have to create a stable foundation. And once that is done, you can start building on that."

Kahn faces reelection tomorrow

Borland recently revised chairman's compensation

By William Brandel

While Borland International, Inc. officials continue to put a brave face on the decision to increase Chairman Philippe Kahn's total compensation with more than $20 million in stock options, the wisdom of their decision could be determined at tomorrow's board election in Redwood City, Calif.

Kahn, the board's chairman, is the only Borland director who will face reelection.

Already, at least one major institutional shareholder has announced that it will withhold support for Kahn.

Borland's Philippe Kahn: *Stronger pay/performance link*

The College Retirement Equities Fund, which manages a pool of more than $61 billion and owns 348,000 Borland shares, said Kahn and other Borland board members have performed poorly in protecting shareholders' interests.

Keith Maib, Borland's chief operating officer, circulated a companywide memo, dated Aug. 22, to explain Borland's position on Kahn's compensation.

"The compensation committee decided that it was in the best interest of the company to increase the link between Philippe's compensation and the company's performance," the memo stated.

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News Shorts

IS shake-up at Philip Morris

Bill Taylor has been appointed vice president of information services at **Philip Morris USA** in New York, replacing longtime top information systems executive Tom Pettibone. Last week, Pettibone said he had been reassigned to another position in the company but declined to elaborate on his new duties or title. A formal announcement will be made within the next few weeks, he said. Taylor was formerly vice president of engineering at the company.

LDDS acquires WilTel

A courtship that began in May concluded last week with **LDDS Communications, Inc.** signing a definitive agreement for $2.5 billion in cash to acquire the **WilTel Network Services** division from the **Williams Cos.** The combined company will have around 3% of the $64 billion long-distance market and a 15,000-mile plus digital system

Dell reports 13% sales increase

Dell Computer Corp.'s rebound continues. The company last week reported it earned $28.6 million on sales of $791.5 million for the second quarter ended July 31. This represents a 13% increase in sales from the $700.6 million it reported in the corresponding quarter last year. Dell said strong Pentium sales, which now represent 24% of the company's systems revenue, contributed to its performance this quarter.

Informix and Tivoli to join forces

Informix Software, Inc. licensed **Tivoli Systems, Inc.**'s distributed systems management technology and plans to embed parts of that in future versions of its OnLine Dynamic Server database. The companies said they also will jointly integrate informix's line of database monitoring and management tools with the Tivoli Management Environment framework to administer OnLine Dynamic Server installations. The integrated products are scheduled to be available in the second half of next year.

Bull confirms suit against TI

Groupe Bull confirmed last week that it filed a patent infringement suit against **Texas Instruments, Inc.** last October alleging that TI used a smart card microprocessor technology copyrighted by Bull. "What you have is a suit filed to protect intellectual property at Bull," a Bull spokesman said. TI refused to comment. "We don't discuss issues of industrial espionage or patent litigation, and this [case] covers both," a TI spokesman said. The suit has been transferred to Texas District Court in Dallas.

SHORT TAKES Judith Estrin and William Carrico, the husband and wife team who founded **Network Computing Devices, Inc.** in Mountain View, Calif., are resigning from their respective positions as chief executive officer and chairman of the board to reportedly look for another start-up venture. Board member Edward Marinaro will become president and CEO.... Donald Shump, formerly top IS executive at **Scott Paper Co.**, was one of more than 600 staffers to be cut from the papermaker's corporate payroll earlier this month.... **Hewlett-Packard Co.** and **Sybase, Inc.** said last week they started up a jointly operated engineering lab to optimize very large database support for HP 9000 Series 800 Unix servers.... IBM's **Integrated Systems Solutions Corp.** signed a 10-year, $110 million deal with **America's Favorite Chicken Co.** in Atlanta to provide technology aimed at improving product tracking, customer preferences, sales cost, inventory control and other processes.

Novell embraces DCE for Tuxedo

By Craig Stedman

Novell, Inc. plans today to announce interfaces that will let its Unix-based Tuxedo transaction monitor interoperate with Distributed Computing Environment (DCE) installations, according to sources briefed by the company.

Demand for DCE remains light and is confined to large shops that are used to complex programming jobs, analysts said. But some Tuxedo users have been clamoring for Novell to embrace DCE to match other transaction monitor vendors such as IBM, Digital Equipment Corp. and Hewlett-Packard Co.

Getting what you want

"We've been pushing for this to happen," said Gene Friedman, vice president of applied technology at Chase Manhattan Bank NA in New York. "We want it, and we need it."

The bank is running Tuxedo in its back-office trading operations but also expects to implement DCE over time, Friedman added.

He and other sources said the Novell software will not be layered on top of DCE, which is the base technology for competing monitors such as IBM's CICS/6000 and the Encina software developed by Transarc Corp. Transarc was acquired by IBM two weeks ago.

Rather, users will be able to make calls between Tuxedo and DCE applications via gateways. For example, Tuxedo programs could use a distributed printing routine written under DCE to print messages indicating the status of transactions.

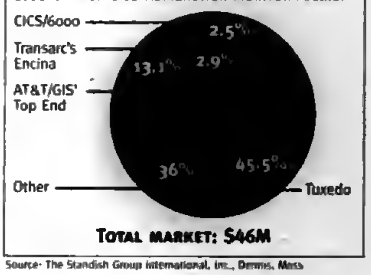
Novell will also release a compiler that converts code written with a remote procedure call format similar to DCE's into a native Tuxedo application, according to the sources. Officials at Novell's Tuxedo Systems Group in Summit, N.J., declined to comment on the announcement.

The level of DCE interoperability promised by Novell "would be sufficient, at least for the time being," Friedman said. He added, however, that Chase Manhattan is "going to have to see it, touch it and feel it before we have any strong opinions" about whether Novell's implementation passes muster.

IBM and Transarc have tried to shine a harsh proprietary light on Tuxedo because of its previous lack of DCE support. But Dave Hudson, director of market research for transaction processing at The Standish Group International, Inc. in Dennis, Mass., said this week's announcement should dilute that criticism.

All dressed up

IBM's CICS/6000 is not expected to surpass Novell's Tuxedo as the leading Unix transaction monitor until 1997



Source: The Standish Group International, Inc., Dennis, Mass.

Technology push

Novell's "go-slow approach" with DCE makes sense given the limited acceptance of that technology and its slow performance, Hudson said. CICS/6000 and Encina have much lower transaction-per-second capabilities than non-DCE monitors such as Tuxedo and Top End from AT&T Global Information Solutions, he added.

"The products that have actually used DCE [as a base] have not demonstrated that it's the right thing to do, mainly for performance reasons," Hudson said.

The DCE interfaces are expected to be available by year's end, sources said. Novell plans to provide increased support for DCE over the next year or so, such as allowing Tuxedo to take advantage of DCE's naming and security services, the sources added.

IBM, Comdisco settle leasing lawsuits

By Craig Stedman

IBM and Comdisco, Inc. last week agreed to settle a trio of lawsuits that IBM and its IBM Credit Corp. leasing subsidiary filed against Comdisco in 1991 and 1992. Without admitting any wrongdoing, Comdisco said it will pay IBM $70 million as part of the settlement.

In two of the suits, IBM charged that Comdisco had illegally cannibalized parts from IBM mainframes and then sold or leased the devices. The other suit alleged that Comdisco had passed off reconfigured IBM memory cards as still being IBM products eligible for maintenance by the computer giant.

Something amiss

Comdisco denied all charges, although it did acknowledge selling the reconfigured IBM memory boards bought from other vendors in late 1990. Despite the continued denials of wrongdoing, "obviously, there was some mishandling of parts" by Comdisco, said Carl Greiner, an analyst at Meta Group, Inc. in Westport, Conn.

The agreement came just one month after Jack Slevin became president of Comdisco, following the death of company founder Kenneth Pontikes. Slevin "had pretty much taken it upon himself to settle these lawsuits," said Bob Djurdjevic, president of Annex Research, Inc. in Phoenix.

"It didn't take him long, and it's about time because I didn't think Comdisco had a leg to stand on," Djurdjevic added. "This was an expensive case of bad judgment."

No more competition

IBM followed up the Comdisco suits with similar counterfeit memory card allegations against four smaller companies in 1992, leading some observers to charge that IBM was trying to quash the leasing business by ridding itself of some irritating competition.

The legal assault did have the desired results for IBM, at least in the memory board market, Djurdjevic noted. "The image I have in my head was of mice scampering away from the hose," he said. The suits "certainly put a stop to those practices."

That may have left users with fewer options for buying memory, but Djurdjevic accused Comdisco and the other vendors of engaging in "shoddy practices" that left customers without legal access to IBM maintenance. For the leasing business as a whole, he added, the suits were "not a life and death situation, but certainly a few fingers got crushed a little bit."

Comdisco said it no longer engages in the activities that prompted the suits.

Meanwhile, IBM and Comdisco agreed to provide mutual backup support for their disaster recovery services and to discuss a possible deal under which Comdisco would resell IBM's AS/400 systems. Those secondary deals prompted Greiner to describe the settlement as a "gentleman's agreement."

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New SCO Unix in sync with Windows

By Jean S. Bozman
SANTA CRUZ, CALIF

The Santa Cruz Operation's mid-1995 release of its SCO Unix server operating system will feature a high degree of Windows integration.

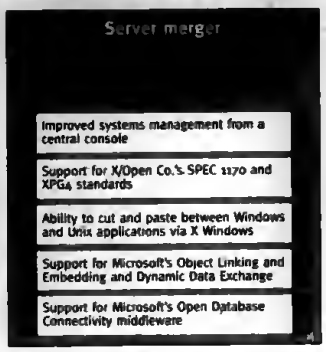
Speaking at the SCO Forum conference for users and resellers here last week, SCO executives outlined a strategy to fortify links between SCO's Unix-on-Intel software and Windows clients.

Strengthening those links is likely to draw applause from SCO's largest sites, many of which link Windows desktops with database servers running on Unix, said Peter Kastner, an analyst at Aberdeen Group in Boston.

SCO, which shipped 153,000 copies of SCO Unix last year, has installed hundreds of replicated servers at some large firms, including Goodyear Tire & Rubber Co. and Rite Aid Corp. "They certainly have earned their stripes in large enterprises," Kastner said, although SCO built its business on small and medium sites.

SCO's new Unix operating system will succeed SCO Unix 4.2, SCO Open Desktop 3.0 and SCO Open Server 3.0, all three of which were built on the same core operating system, said Scott McGregor, senior vice president of products.

The new release, code-named "Everest," will link with Microsoft Corp.'s Windows NT servers as a peer through the licensed use of AT&T Global Information Solutions' Advanced Server for Unix networking software, which was jointly developed with Microsoft. It will also have improved Unix file system capabilities, including journaling for better backup and recovery, support for redundant arrays of inexpensive disks Levels 0, 1 and 5 and graphical systems administration tools (see chart).



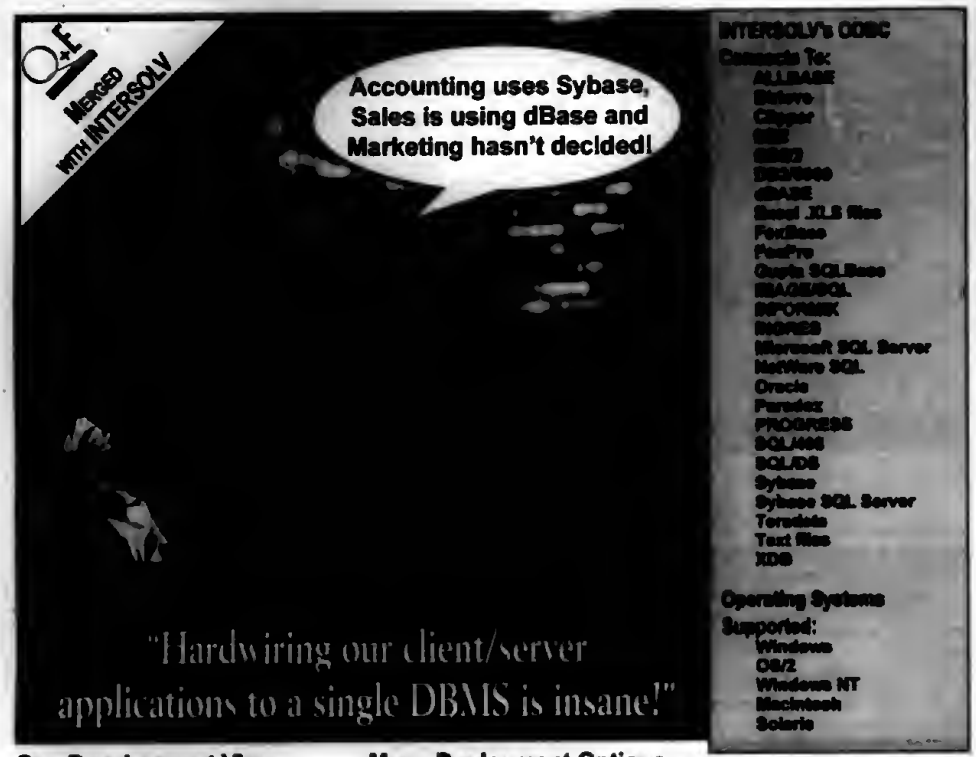
Still trailing

Some analysts see SCO's claims of Windows friendliness as overstated because much of the strategy will be based on licensed software that is available to other Unix vendors. As for Unix features, "they're playing catch-up with the likes of AT&T, HP and IBM on reliability and systems management," said Paul McGuckin, a senior analyst at Gartner Group, Inc. in Santa Clara, Calif.

Some of SCO's largest users said they did not learn the details of the next Unix release until the SCO Forum. Pizza Hut, Inc., which uses SCO servers at each of its 4,000 retail stores worldwide, will not upgrade all sites right away because of the size of the task, said John Payne, MIS director of point-of-sale development at Wichita, Kan.-based Pizza Hut.

But Chris Rodriguez, director of MIS at Dr. Pepper Bottling Co. of Texas in Dallas, said he is interested in SCO's Windows and Unix strategy. The site uses Windows applications on a Novell, Inc. NetWare LAN, along with three SCO Unix servers, to host an IBM 4381 mainframe downsizing project.

SCO took its first steps toward Windows integration last year with its Wintif 1.0 graphical user interface, which displays Motif applications on a Windows desktop. SCO supports Microsoft's LAN Manager 2.2, which is the basis for the Advanced Server for Unix. But until now, Unix servers could not control NT server resources or support NT security in mixed networks, said Bob Kruger, Microsoft's director of strategic relations and standards.



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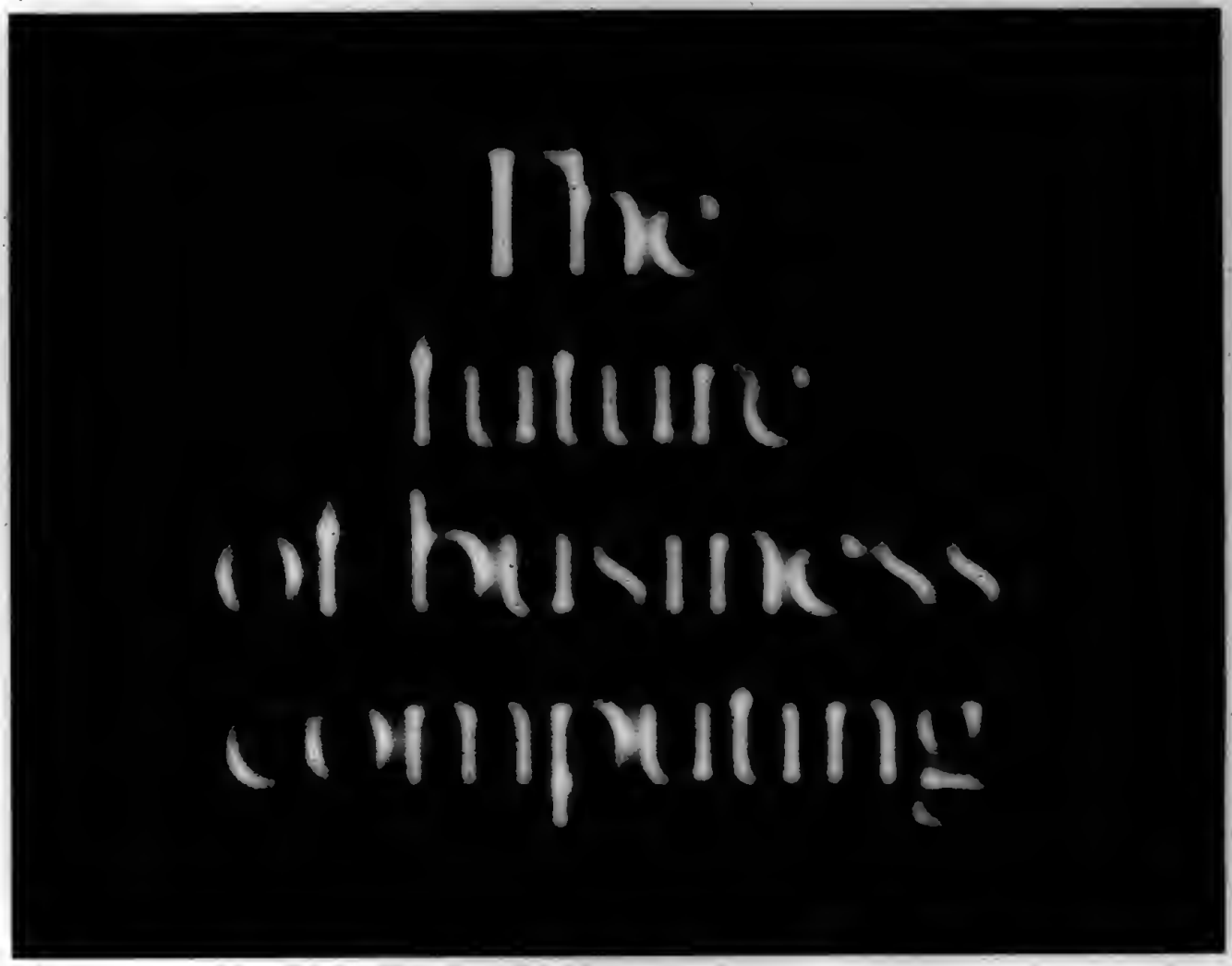

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DEC customers brace for possible Oracle deal

But Sequoia technology talks raise few eyebrows

By Mary Brandel

Customers held their breath last week as more reports surfaced that Digital Equipment Corp. had reached a preliminary agreement with Oracle Corp. to purchase Digital's database business.

Neither company would comment on or confirm the negotiations. However, some customers are already crafting a line of defense.

"My fear is that [Rdb] will be capped and we'll be presented with an easy migration, which would require us to purchase some number of Oracle products," said Steven Hankins, vice president of information systems at Tyson Foods, a large Rdb customer in Springdale, Ark.

In preparation for that possibility — and to keep his options open — Hankins has done some preliminary work to ensure that a product like Sybase, Inc.'s database would fit in as easily as Oracle's. "We don't want to be pushed," he said.

"We're looking into alternatives related to a migration" from Rdb, said Larry Isaacson, director of systems development at Wawa, Inc., a retail chain in Philadelphia. For now, though, Isaacson said he was fairly confident the planned upgrades would stay intact — sale or no sale. Digital has said it will produce a version of Rdb for Microsoft Corp.'s Windows NT.

In other Digital dealings last week, observers hardly blinked at the news that Sequoia Systems, Inc. and Digital are in exploratory discussions regarding the sale of Digital's fault-tolerant lineup.

The difference is market size: Digital's $116 million database business in 1993 was nearly eight times the size of its $15 million fault-tolerant business, according to International Data Corp. (IDC) in Framingham, Mass. Its total share in the fault-tolerant market is less than 1%, according to Steve Josselyn, an analyst at IDC.

Customers are most concerned about the fate of Rdb, which accounts for 64% of Digital's database revenue and boasts licenses in the 70,000 range. Published reports last week placed the value of the sale at $100 million

Attention grabber

Most said Oracle's alleged interest in Rdb is its large customer base. "It's doubtful that Oracle will put any effort at all into upgrading Rdb," said Richard Finkelstein, an analyst at Performance Computing, Inc. in Chicago. "They'll either migrate customers onto Oracle or somehow provide cross-connectivity, with the idea being gradual migration."

Customers are also concerned about higher maintenance fees. "The cost of Oracle and Rdb are light years apart," said Ed Homko, systems manager at Dr Pepper Co./The Seven-Up Co. in Dallas. If the deal was inked, he said, "we would consider other platforms. It would be an open field."

At the same time, observers said Oracle could make use of Rdb, which is considered a high-quality product. "It's got a demonstrated ability to back up databases at a rate of 40G [bytes] an hour," said Keith Hare, senior consultant at JCC Consulting in Granville, Ohio. "If you've got an eight-hour shift to do backups, you could support a 320G-byte database."

Steve Hendrick, an analyst at IDC, noted that Rdb could also be "an important cash cow" for Oracle "if they pick up Rdb and the resources for maintenance and support, and if there's not much requirement for R&D."

Much hinges on how Oracle presents the deal and whether Digital engineers move to the company to continue development. A number of sources said at least one key Rdb engineer has left the company, although Digital claims the group has had little attrition.

In any case, most customers said a transition would likely occur over a three- to five-year time span.

In other news, Digital sold its 7.8% share in Ing. C. Olivetti & Co., an Italian computer maker that was an early adopter of the 64-bit Alpha AXP microprocessor. Digital said it was disappointed in the Alpha sales generated by the Olivetti alliance but that Olivetti would continue to sell Alpha systems.

The CW Guide to Midrange Systems, Page 77

Video games

CONTINUED FROM PAGE 1

the large amount of broadcast traffic stemming from dozens of Harvey Mudd students playing the just-released shareware game of Doom over the school's dormitory network.

While ID Software, Inc. in Mesquite, Texas, has since solved the problem with a patch, the initial release wreaked significant network havoc.

"Doom was a big problem for our computer network and several other universities. It slowed down every other machine on the network," Lilley said. He and other sources said the game brought down Carnegie Mellon University's backbone during finals week, for example.

Network games such as Doom have spread like wildfire because of their fast pace, slick graphics and spirited competition. But they actually can spell doom for corporate networks by leaving major headaches for network and systems administrators. Network games typically use a lot of bandwidth and system storage and can generate huge amounts of network traffic.

Since its initial release last year, Doom has also caused network problems at several corporations. For example, an official at ID Software confirmed that Version 1.1 of Doom caused network crashes at sites such as Intel Corp., Origin Systems, Inc. and Spectrum HoloByte, Inc.

Horror stories

Several analysts reported hearing similar horror stories from their clients but declined to name them.

"We've seen very high network activity from games in many companies, especially where Doom is being played over the network," said Bruce Ryon, a multimedia analyst at Dataquest, Inc. in San Jose, Calif. "Doom is the first example of a network game exploding, and it's become a real problem."

While there are more than 150,000 registered Doom fanatics, the installed base of registered shareware users represents only about 1% of the software's installed base, according to industry estimates. ID Software estimates that the user base is closer to 1 million.

Put simply, network games such as Doom, InterCorp, Inc.'s Corridor 7 and Velocity Development Corp.'s SpectreVR for PC DOS and Macintosh environments are resource hogs. For example, Doom requires 4M bytes of RAM and 10M bytes of hard disk space.

Fast-paced and realistic graphics *have brought Doom and other video games a wide following on company networks*

Although Intel would not confirm a Doom-related crash, one source close to the company said a memo circulated recently by Intel's network manager implored employees not to load the game on their PCs because "it can be destructive to a network."

At The Tolly Group, a consulting and independent testing organization in Manasquan, N.J., executives leaving work late one night wondered why all their engineers were still "working" furiously at their terminals. Doom was their answer.

So Tolly ran an analysis to see how resource-intensive the game was, and the results were horrifying, said chief operations officer Neil Anderson. Doom Version 1.1 was coded in a broadcast fashion that sent data to each node on the network at a rate of 240K bit/sec. Because the typical load a LAN can handle is 56K bit/sec., the broadcasts brought networks to their knees, he said.

ID Software released a patch in January that has supposedly fixed the problem by allowing players to talk directly to one another at a rate of 48K bit/sec.

Still, foreboding news for network administrators is on the horizon. "Doom II: Hell on Earth," which is said to be just as intensive — if not more so — is set to hit the streets Oct. 10, observers said.

On the job with the Terminator

The solution to the problem of employees playing network games in the office, some industry analysts say, is simple: Fire them.

"I think the easiest cure is simply to put a few pink slips in some strategic in-boxes and let [these] employees go home and play video games for eight hours a day," said Jeffrey Tarter, editor of "Soft Letter," a newsletter in Watertown, Mass.

Several companies contacted last week said they have or are putting policies in place to do just that.

For example, Intel's business code of conduct decrees that its employees "use company assets [only] for legitimate business purposes" and that "failure to comply can result in termination."

The Travelers Cos. in Hartford, Conn., has instituted a policy forbidding any personal use of an office computer that may interfere with work functions. The company reserves the right to review data on company PCs at any time, and violators are subject to disciplinary action, including termination, said Steven Toce, an engineering consultant at the insurance firm.

The Ford Motor Co. in Norfolk, Va., monitors the use of its PCs on a monthly basis. "We don't want any software loaded on our PCs that is not owned by Ford Motor Co.," said Bill Marshfield, supervisor of data processing. "When people bring in their own software, such as games, you could run into viruses and all sorts of problems."

— Stephen P. Klett Jr.

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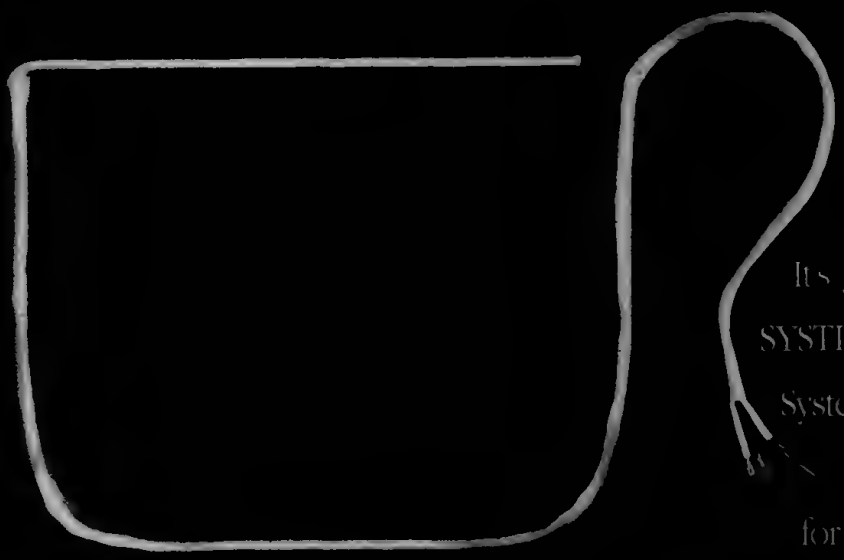

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Server prices tumble once again

IBM matches Compaq's cuts, others said to follow

By Jaikumar Vijayan

Ciaran Brady's dream PC costs less than $2,000, is based on the fastest Pentium chip available and features at least 12M bytes of RAM, 280M bytes of disk space, a fast local bus, network support and multimedia features such as voice and video capabilities.

Brady, a senior business analyst at Interstate Assurance Co. in Des Moines, Iowa, acknowledged that most of the company's desktop applications may not need the force of such a system right now. But if prices keep falling the way they have been, he said, "there's no reason to continue with 486 systems." He predicts it will not take long for that to happen.

Falling PC prices indicate that Brady's wish list could be fulfilled sooner than he expects. Last week, for instance, the IBM PC Co., in a swift response to Compaq Computer Corp.'s aggressive price cuts a week earlier, announced its own rollbacks. IBM cut prices on several desktop and server models by up to 27%. For example, an IBM Server 95 running on a Pentium 66-MHz processor with a 1G-byte hard drive and 16M bytes of error correction code memory now lists for $8,647, down more than $1,000.

As other vendors prepare to match the cuts — at least partly in response to falling Pentium and component prices — users can expect more features in new boxes at today's prices, analysts said.

Getting more for less

	Server management	Price Jan. 1994	Price 1994
60-MHz Pentium	Yes	$7,600	$7,287
60-MHz Pentium	Yes	$7,649	$7,169
60-MHz Pentium	Yes	$10,287	$7,360
60-MHz Pentium	Yes	$8,999	$7,468

Source: WorkGroup Technologies, Inc., Hampton, N.H.

Already, entry-level desktop and server configurations bear little resemblance in price and features to similar systems hawked six months ago. This is likely to change even faster over the next quarter or so, predicted Jennifer Munson, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

For example, a typical base desktop configuration selling for less than $2,000 features 8M bytes of RAM, 210M to 340M bytes of hard disk space and some network and multimedia support, including audio, video and CD-ROM support. It is usually based on an Intel Corp. 486DX2 processor.

Typical entry-level servers feature the same processor but have at least 16M to 32M bytes of RAM, up to 1G byte of disk space, enhanced integrated drive electronics (IDE) or wide SCSI drives and limited network management features.

As vendors introduce products for the busy season, users are sure to get more bang for the buck, analysts said.

Stella Kelly, an analyst at Computer Intelligence/InfoCorp in La Jolla, Calif., suggested that vendors may compete on features when the price differential among major vendors begins to fade.

Pentium ubiquity

For instance, 486DX2 processor systems are almost sure to be replaced by 60-MHz Pentium-based PCs for the same price by December, analysts said. Analysts also expect vendors to offer more disk space and multimedia capabilities and higher-performance IDE drives. In addition, 1G-byte standard disk storage could be doubled, and vendors could offer multiple-processor-based systems with better disk I/O at current prices by the first quarter of next year, analysts said.

As vendors clear the decks for the busy season, users can expect at least a few Pentium 60-MHz systems to hit the market in the sub-$2,000 range and Pentium 90-MHz systems for less than $3,000, according to Randal Giusto, an analyst at BIS Strategic Decisions in Norwell, Mass.

Chicago

CONTINUED FROM PAGE 1

Microsoft's Product Support Services, said overall support calls average about 23,000 per day. The current installed base of Windows is more than 60 million units worldwide, the company said.

Steve Ballmer, Microsoft's executive vice president of sales and support, said the company anticipates four to six times more phone calls when Chicago ships. To handle the flood, the company is contracting with as many as seven firms that specialize in technical support.

Microsoft's *Steve Ballmer: A support call surge will come when Chicago ships*

"We will ramp up with partners to help cope with Chicago," Ballmer said.

Users and analysts generally hailed the plan.

"I definitely think it's a great idea," said Ki Wilson, a senior microcomputer analyst at Stone Container Corp. in Chicago. "It's very frustrating when users can't get through on the line, [and then when they do,] not find knowledgeable people," he said. This is a particularly hot issue given that internal corporate budgets for PC support are tight, Wilson added.

"Outsourcing support is hardly a radical idea," said Jeffrey Tarter, publisher of "Soft Letter," an industry newsletter in Watertown, Mass. "For a while, everybody was terrified that users would rebel at the idea that companies weren't answering their own phones. [But] if you get through and get the right answer, you're happy."

Users may never know the difference. They will still call a single Microsoft phone number, and the person who handles their problems will appear to be a Microsoft employee.

"We didn't want to confuse the customer [or] put people in a position where they get a marketing pitch when they called about a support problem," Willingham said.

Microsoft has quietly outsourced some technical support for more than two years with experienced support contractors such as Corporate Software in Norwood, Mass., Willingham said. Corporate Software will likely be one of the outsource support providers for Chicago, officials at both firms indicated.

To work this sleight of hand, Microsoft is installing a new phone switch that will route calls to its three national support centers and the contractors' support sites.

Phone frenzy

After the debacle it took in 1990 for not anticipating the explosion of calls for Windows 3.0, Microsoft began a continual upgrade program for its technical support operation.

That was then (1990) . . .

- Expected calls to jump 100% for Windows 3.1 release
- Added new support facilities and expanded existing ones
- Expanded phone switch capabilities

This is now (1994) . . .

- Expecting calls to jump 400% to 600% following Chicago release
- Adding seven contract support facilities
- Putting in new phone switch to route calls

The switch, which will be operational by the end of September, will enable Microsoft to consolidate all incoming support calls, route each caller to the first available support engineer and compile statistics on how long each stage of the process takes on a call-by-call basis, Willingham said.

The first test of the plan will come this fall or early winter when Microsoft ships beta releases of Chicago to hundreds of thousands of users. By then, two or three of the outsource provider sites will be trained and online, Willingham said. She said 20 to 25 firms will bid to take on part of the support burden.

Even though Microsoft has tried in the past to anticipate the explosive growth in user calls following the release of major systems software, executives admitted they have always grossly underestimated demand. This has happened repeatedly, even with aggressive planning, because use of Microsoft's systems has grown exponentially over the years. Planning for Chicago support began 16 months ago, officials said.

Support calls always jump when a vendor ships a new release of software, particularly systems software, because of installation problems and new features.

The fact that Chicago combines the functions of DOS and Windows and has built-in networking and electronic-mail functions will complicate matters even further, Tarter said.

"Even with a new phone switch, [they're] going to get swamped," he said. "My advice is do not try to call for support during the first few weeks."

First 90 days

Purchasers of Microsoft personal operating system products (MS-DOS, Windows, Windows for Workgroups) receive 90 days free phone support, which begins with the first support call.

After the 90 days expire, several paid support options are available, including an annual fee, a per-call credit card option and a 900 number. When the 90 days are about to run out, Microsoft will send users a postcard informing them that they can also purchase support from outsource contractors, said Deborah Willingham, vice president of Microsoft's Product Support Services.

Support for the company's desktop productivity applications is still free with no cutoff date.

— Stuart J. Johnston

SAP, Microsoft extend relationship

By Rosemary Cafasso

At its annual user conference this week, SAP America, Inc. plans to announce a series of technical boosts for its R/3 client/server software that will include Microsoft Corp.'s Object Linking and Embedding (OLE) 2.0 support, company officials said last week.

SAP will use the Sapphire International conference in Orlando, Fla., to unveil Version 2.2 of R/3, an upgrade that will include extended functions for the manufacturing and financial modules within the SAP client/server software suite.

SAP will also preview an on-line consulting service that will allow users to interact with SAP as it remotely resolves system problems, according to Paul Wahl, director of international marketing at parent company SAP AG.

In addition, SAP said it is extending its relationship with Microsoft to include more joint marketing efforts for R/3 on Windows NT. SAP first shipped R/3 on NT earlier this year and now claims to have 40 customers worldwide.

The SAP/Microsoft effort could eventually deliver a more integrated software environment that blends desktop tools such as word processing and spreadsheets with business applications. For example, OLE 2.0 support will allow customers working in OLE 2.0-enabled applications, such as Word or Excel, to make direct calls to R/3, accessing its business rules to ensure data integrity.

"One of the biggest problems with SAP is the inability to get data in and out," said Jack Spurgeon, vice president and director of the systems and computer services unit at Eastman Chemical Co., which uses SAP's mainframe and client/server software as well as Microsoft's Office. "We are hopeful that this seamless way of getting data back and forth between R/3 and Excel will be true."

The partnership could give both vendors a boost on the credibility front. Microsoft could benefit from SAP's strong reputation with top-level information systems and business executives; SAP could shake some of its stodgy mainframe image.

"In the MIS person's mind, SAP has a great deal of credibility that Microsoft lacks," said John Mann, a senior analyst at The Yankee Group in Boston. "Microsoft needs to learn the commercial culture, and SAP can say the right words."

Opportunity lost

While SAP America and Microsoft were promoting themselves last week, the folks at Dun & Bradstreet Software may have had wistful thoughts of what might have been.

Before Microsoft decided to install SAP's R/3 as part of its client/server migration, it considered going with D&B Software's SmartStream. In 1993, the two firms shared ideas on what should go into D&B Software's manufacturing and distribution software, according to D&B.

Microsoft confirmed it had evaluated the software for internal use but could not provide details.

The two companies also have existing marketing agreements for SmartStream on NT.

Last fall, D&B Software delivered to Microsoft a version of its FinancialStream software on an early version of Windows NT as a "proof of concept," said Mike Rice, director of strategic business operations at D&B Software.

At that stage, however, the firms had different ideas about the software and delivery dates, Rice said.

Instead, D&B Software decided to stay focused on its Unix versions and ship an NT version later this year, Rice said. Microsoft decided to team with SAP. The NT version of SmartStream Decision Support System will officially roll out next month, Rice added.

—Rosemary Cafasso

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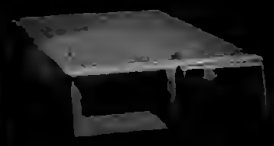

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MOTOROLA

Spyglass to commercialize future Mosaic versions

By Ellis Booker

■ All future "commercialized" versions of Mosaic, the wildly popular graphical viewer for the Internet, will be developed and distributed by Spyglass, Inc. under a master license agreement signed with the University of Illinois at Urbana-Champaign last week.

The university's National Center for Supercomputing Applications (NCSA) first put the Unix version of Mosaic on the Internet in January of last year. The deal last week was an expansion of a multimillion-dollar joint development and licensing agreement the university signed in May with Spyglass, a Savoy, Ill., company formed by ex-NCSA developers in 1990 to enhance and commercialize NCSA technologies.

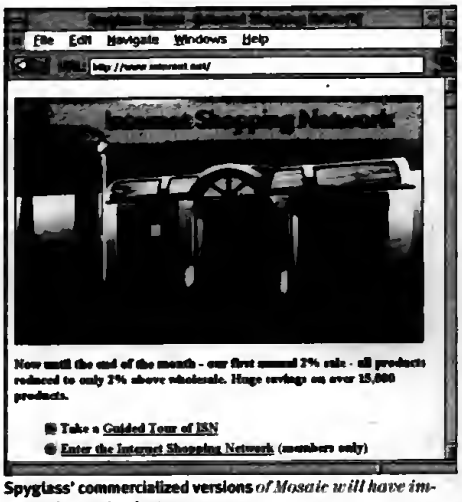
The NCSA said it believes there are more than 2 million copies of Mosaic in use. Another 30,000 to 50,000 copies of the viewer are downloaded each month from Internet servers. Mosaic allows users to access some 3,000 graphical multimedia databases.

"With the overwhelming demand for commercial versions of Mosaic, our distribution system needs to be dramatically strengthened," said Larry Smarr, director of NCSA.

Stable, standard

Spyglass President Douglas Colbeth said the benefit of a commercial version of the viewer, dubbed Enhanced NCSA Mosaic, would be a "stable and standard" product across multiple computer platforms. This would make computer and software vendors more receptive to bundling the product with their systems, Colbeth claimed.

He predicted that there would be more than 20 million copies of Spyglass' Mosaic within a year.



Spyglass' commercialized versions *of Mosaic will have improved security features*

Future improvements planned for the Spyglass implementation will be features aimed at supporting electronic commerce across the Internet. Those include improved security, secure payment processing and integration with other software applications through support for tools such as Microsoft Corp.'s Object Linking and Embedding 2.0 and Apple Computer, Inc.'s AppleEvents.

Public history

The commercialization of applications and protocols first seen and freely distributed on the Internet has a long history, according to Tony Rutkowski, executive director of the Internet Society in Reston, Va.

"What's nice is the fact that part of the tradition has been to maintain the public version," he said.

Indeed, NCSA's Mosaic will continue to be available as a "free with copyright" product, meaning that anyone can download it from the Internet for individual use.

"We'll continue to support and enhance the public version," stressed Joseph Hardin, associate director at the NCSA's Software Development Group. He added that part of the agreement with Spyglass calls for technology sharing between the two parties.

Delta picks AT&T

CONTINUED FROM PAGE 1

Transportation industry analysts were generally dubious that the venture would generate significant revenue.

"No one is jumping up and down that this is a big new product for Delta," said John Eichner, chairman of SH&E, Inc., a transportation consulting firm in New York.

"American [Airlines] has been relatively successful selling reservation and [information technology] services ... but they've invested a lot of money and taken a lot of years to build that business," said Tom Woodall, publisher of "CRS Update," a Garrett Communications newsletter in Rockville, Md.

The fliers club

Vendor	Customer	Value
EDS	Continental	$2.1 billion
AMR Corp.	Alaska Airlines	Not available
AMR Corp.	Canadian Airlines	$2 billion*
IBM Canada	Air Canada	$800 million

*Estimated 10-year deal

Excluded from the outsourcing deal will be Delta's massive mainframe-based reservations operations, which will be outsourced to Worldspan under a separate agreement announced last week. Delta owns a 38% stake in the Atlanta-based computerized reservation company, which was formed in 1990 and currently processes reservations for Delta, Trans World Airlines and Northwest Airlines.

The two companies said they are investing an unspecified but equal amount in the venture, although Delta is providing most of the 1,200-member staff by transferring about 1,110 of its 1,500 information technology workers. AT&T GIS will initially contribute around 30 employees, company officials said.

Another 200 to 300 Delta employees will transfer to Worldspan; about 150 will stay with Delta to work on information technology planning, and a "minimal" number will be let go, said John King, Delta's vice president of information technologies.

Other conditions

In addition, a chief executive officer to head the new company must be named. Officials close to the deal said this will happen within 60 days.

AT&T GIS and Delta must also agree on hiring a third-party benchmarking firm to provide ongoing value measurements that will be used to determine fees charged to Delta.

The venture should begin selling services to other transportation companies within three or four years, said Jerre L. Stead, AT&T GIS CEO. He confirmed the Delta deal is by far the largest yet by the AT&T unit, which already handles hundreds of outsourcing contracts.

King said the joint venture would continue Delta's efforts to convert its legacy operations to client/server systems. The airline currently spends about $350 million annually on information technology, about $30 million of which is for reservations, he said.

AT&T GIS' experience in open systems will be useful to Delta, which has committed itself to an open systems strategy. But AT&T GIS' experience in massively parallel processing (MPP) technology will not take on Delta's reservations systems anytime soon, industry analysts said.

Worldspan is better outfitted with mainframe-based, transaction-processing facility systems than is AT&T GIS, explained Warren Gallant, vice president of Technology Partners, Inc., a Houston consultancy that advised Delta on the deal.

Client/server or MPP platforms cannot handle an airline's reservations system yet, agreed Jeff Canin, a vice president and technical analyst at Salomon Brothers, Inc. in San Francisco.

Many issues in outsourcing pact

John King, Delta's vice president of information technologies, said Delta picked AT&T GIS over established outsourcers such as Electronic Data Systems Corp. and IBM's Integrated Systems Solutions Corp. because AT&T GIS was more willing to offer pricing based on productivity than operations.

Yet some industry observers were skeptical that Delta and AT&T GIS broke new ground in value-based pricing. That concept has received plenty of attention but is difficult to implement because few if any proven metrics accurately gauge an outsourcer's impact on the customer's business [CW, June 21, 1993].

Outsourcers and their customers are searching for new pricing models for distributed computing environments as they move [illegible] from the familiar economics of mainframe computing [CW, Aug. 3, 1992].

"While AT&T [illegible] said there was innovative pricing, [illegible] were not forthcoming," said Mark Hodges, vice president of [illegible] in Mountain View, Calif.

But Warren Gallant, vice president of Technology Partners in Houston, claimed that "a considerable portion of AT&T [illegible] profits is tied to its ability to achieve productivity gains."

King also cited AT&T GIS' superior pricing in networking and the company's willingness to enter a joint venture as factors in Delta's decision to pick [illegible].

King acknowledged that Delta had been [illegible] negotiations that [illegible] would entrust too [illegible] to a sole [illegible] in selling its own [illegible] software.

In [illegible] Hewlett-Packard Co. [illegible] outsourcing job for [illegible] systems technology supporting the daily task of [illegible] and passenger [illegible].

[illegible] from HP [illegible] AT&T GIS, [illegible] to outsource [illegible] Microsoft [illegible] Inc. [illegible]

— [illegible] Hodges and Ellis Booker

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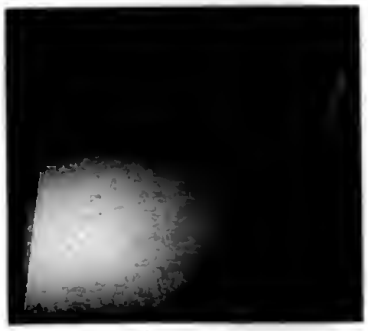

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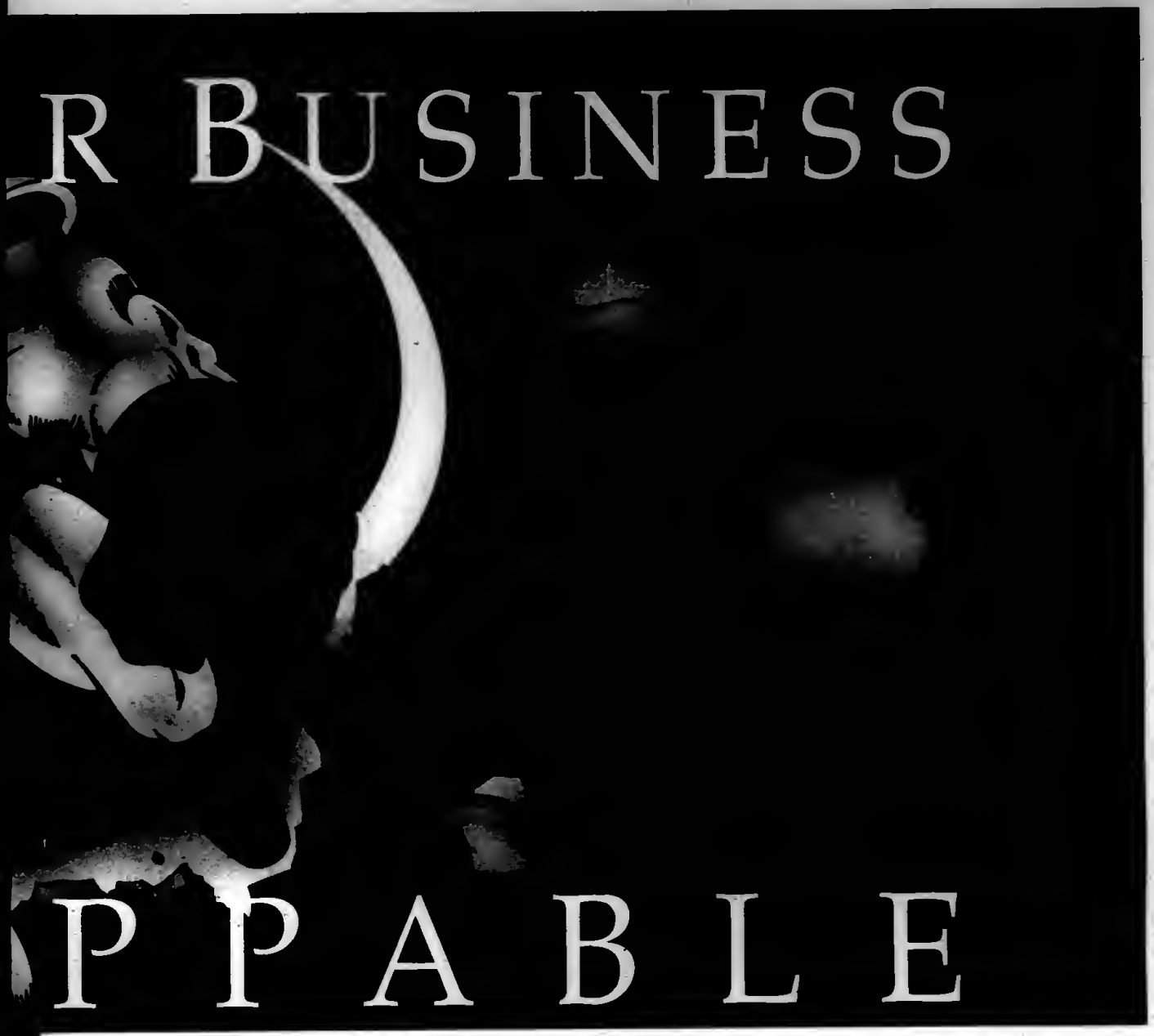

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FCC flip-flop not expected to impact future auctions

By Michael Fitzgerald

After the Federal Communications Commission's recent about-face on some licenses for next-generation wireless communications, one might think the "F" in FCC stands for "finks."

Yet most observers contacted expect the turnabout to have little impact on the auctions for chunks of the broadband radio spectrum.

Last December, the FCC gave away three "pioneer's preference" licenses to technical innovators for wireless broadband Personal Communications Services (PCS). The giveaway occurred after Congress passed an omnibus budget bill with a provision that the FCC seek ways to charge fees for wireless spectrum.

Strong Congressional and industry pressure to charge for these licenses increased after higher-than-expected bids were cast at narrowband PCS auctions. The FCC first said it would charge for the narrowband pioneer's preference license granted to Destineer Corp. The agency also decided to charge for the three broadband PCS pioneer licenses.

Narrowband PCS allows for advanced paging services, such as two-way paging. The higher-capacity broadband spectrum provides next-generation voice and data capabilities. Of the 2,071 PCS licenses available at auction, only 10, all in the narrowband, are nationwide.

There are 99 regional broadband licenses, which most analysts expect will be used to fill out nationwide wireless voice and data networks to rival the proposed AT&T Corp./McCaw Cellular Communications Corp. network that awaits regulatory approval.

Legal fair

Since the FCC reversed its decision to grant five pioneer preference licenses, two of the pioneers have appealed

Broadband PCS:	Status
American Personal Communications, Washington	Filed suit against FCC
Cox Enterprises, Atlanta	Filed suit against FCC
Omnipoint Communications, Colorado Springs	Suit under discussion
Narrowband PCS:	**Status**
Destineer, Jackson, Miss.	Filed suit against FCC

The three broadband players — Omnipoint Communications Corp. in Colorado Springs, American Personal Communications, Inc. in Washington and Cox Enterprises, Inc. in Atlanta — have one of the two allotted licenses in New York, Washington/Baltimore and Los Angeles/San Diego, respectively. The second license in these areas is expected to be hotly contested.

Winners take all

Under the FCC's provision, pioneer's preference winners can keep their licenses, but they must pay for them. The price will be either 90% of the winning bid for the second license in their market or 90% of the average price of the licenses in the 10 most-expensive PCS markets.

The pioneer's preference holders pick which amount they would like to pay.

"What the FCC did is atrocious and very bad for the industry," said Rob Balgley, vice president of marketing at Wireless Telecom, Inc., a reseller of wireless services and products in Englewood, Colo. "It's a clear indicator [that the government] doesn't understand what it's going to take to build the whole information superhighway."

Balgley said the information highway will be built faster if the government cares for and feeds small companies such as Omnipoint, which tend to produce innovative ideas. The FCC's about-face could also damage potential standards-building efforts, he added.

The FCC's reversal "is significant for those three companies," said T. M. Dougherty, executive director of the PCS Group at BellSouth Wireless, Inc. in Atlanta. "The only thing it does is make the other [Major Trading Area] licenses in those markets much more precious."

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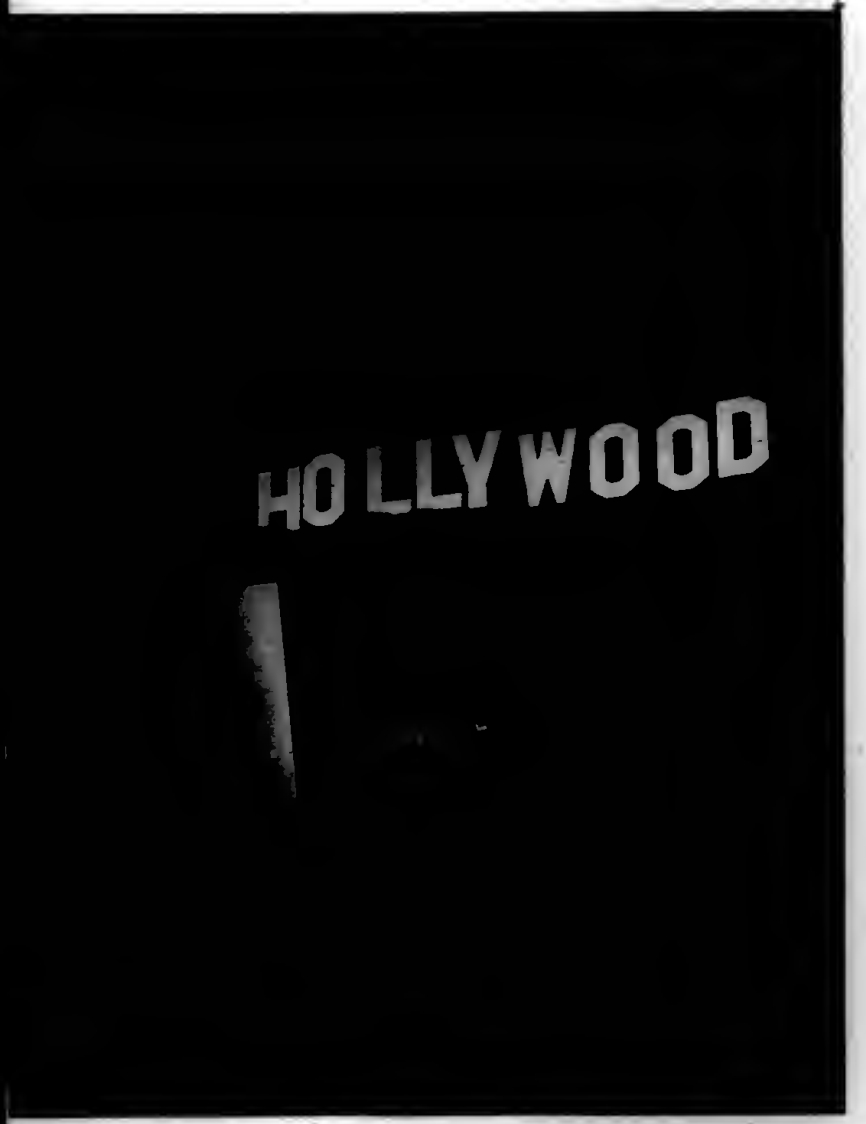

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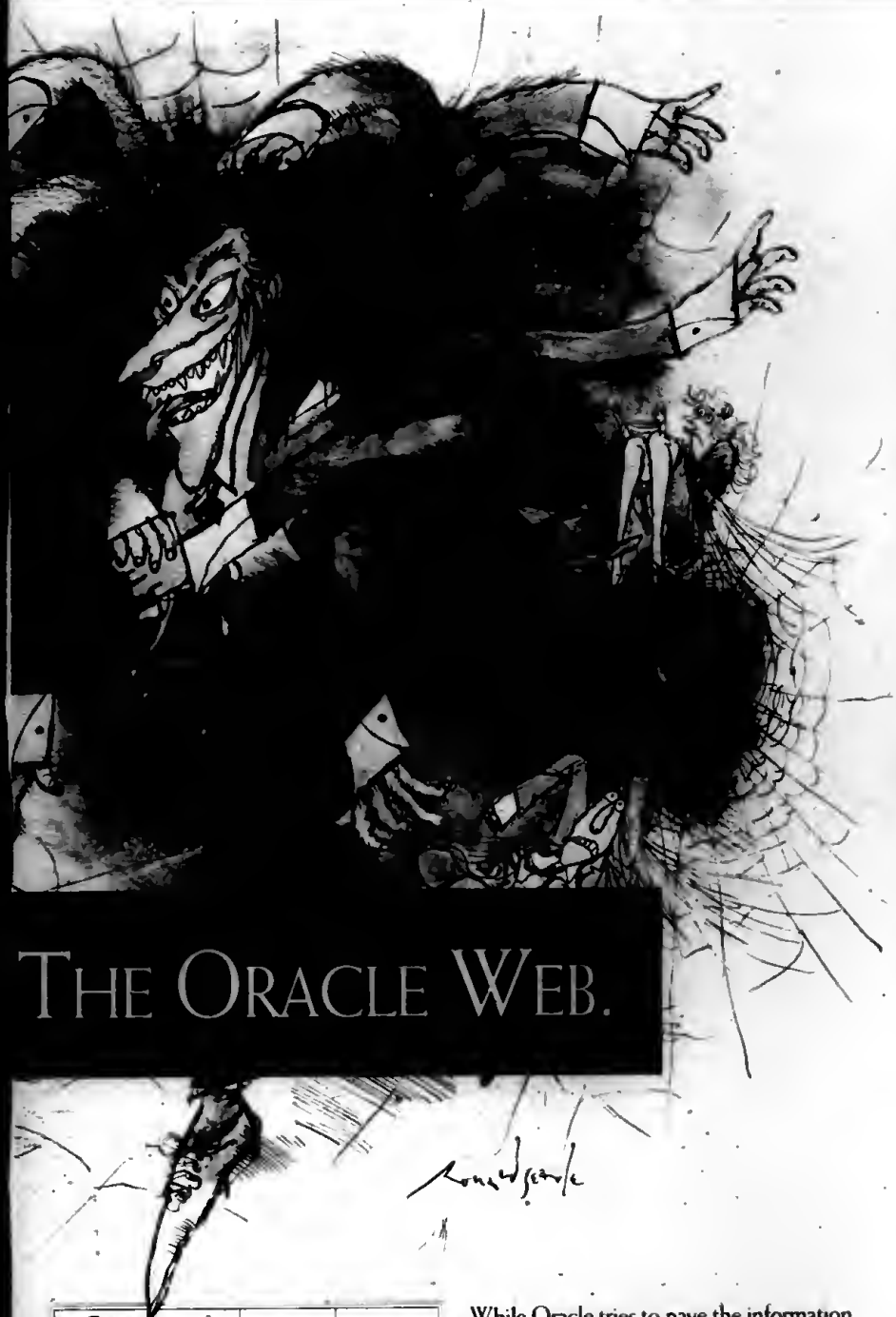

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Digital bolsters service offerings

By Mary Brandel

Digital Equipment Corp. will bulk up its multivendor services next month by packaging some of its more innovative offerings into two new services. The vendor hopes the moves will halt the decline of its maintenance revenue.

In fiscal year 1994, services slipped 7.7% from the previous year to $6.3 billion — no small concern for a company that depends on those sales for nearly half of its $13.5 billion in revenue.

With Digital's PC Utility service, customers can contract with the vendor to lease, install and track PC assets and design, support and manage LANs.

The Software Utility service is intended to help users evaluate, purchase and manage PC software. Digital is licensed to manufacture and electronically distribute software from Microsoft Corp. and Lotus Development Corp. It can also remotely manage licenses.

Both services are being piloted outside the U.S. and will be offered worldwide by the middle of next month. Pricing is customized according to network size.

In its eight-year involvement in multivendor services, Digital has established a solid reputation, according to Jeff Kaplan, director of Dataquest Worldwide Services Group in Framingham, Mass. It had a strong base long before IBM, Hewlett-Packard Co. and other competitors recognized the opportunity, he said. Currently, multivendor support accounts for 20% Digital's overall service revenue.

Above average

Service offerings accounted for 45% of Digital's revenue in 1994. The industry average for systems vendors is about 30%, according to Dataquest, Inc.

But despite 40% growth this year, multivendor offerings have not offset declines in big-ticket maintenance sales.

One potentially lucrative area for Digital is remote license management, which is a rising concern for users as distributed computing and user-based pricing add complexity to the task [CW, Aug. 22].

Though license management services have "some interesting implications," said Ed Homko, a systems manager at Dr Pepper Co./The Seven-Up Co. in Dallas, "I'm not sure I see the benefit of it yet."

Currently, five people at Dr Pepper are charged with that task. "Even if it were cheaper [to use Digital services], we'd still need somebody here managing licenses," Homko said.

Leading the pack

In electronic software distribution, Digital is ahead of the curve. "It's becoming a more sturdy piece of their business," Kaplan said, referring to Microsoft and Lotus joining the list of vendors whose products Digital can distribute. IBM has announced a similar initiative, he said.

Yet the multivendor service image has not taken hold for at least two large Digital users: WaWa, Inc., a 512-store convenience store chain in Philadelphia, and Blue Cross/Blue Shield of Illinois in Chicago. Both contract with Digital for traditional maintenance but said they do not plan to buy further services.

"We're not real thrilled with how Digital is doing things now," said Mike Karlovich, a systems manager at Blue Cross. "Service has gone way down." Karlovich said he pays for four-hour response time but waits six to eight hours.

Digital officials attributed those problems to glitches in a new call-handling system it implemented in June. The problems are largely fixed now, they said.

Larry Isaacson, director of systems development at WaWa, used Digital to design its LANs, "but we found that we need to root around to find the right people," he said. "They have stars, but they're hard to find."

Changing such perceptions about service is crucial for Digital. The services unit has hired almost 1,000 employees in the past 15 months. Its goal is to service 65% to 80% of non-Digital systems.

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Governor of Puerto Rico

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MICHAEL GORIN
President
ARX, Inc.

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			YES
Parallel OLTP Software	YES	NO	YES
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Parallel Index Software	YES	NO	YES
			YES
Parallel Backup	YES	NO	YES
			YES
Platforms Supported with Parallel Software	20+	Ø	25+
			YES
Parallel Resource Management and Control	NO	NO	YES
			YES
Static Database Partitioning	NO	NO	YES

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John Morrell, International Data Corporation:
"The Informix Dynamic Scalable Architecture has the potential to vault Informix past its primary competitors for high-end database processing functionality."

David McGoveran, Alternative Technologies:
"The new Informix database server architecture will put the vendor ahead of competitors Oracle and Sybase in support of multiprocessing systems."

Rob Thalomeier, Meta Group:
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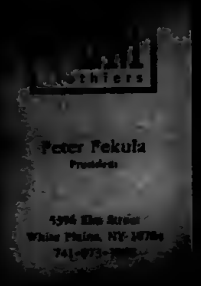

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yes NetWare

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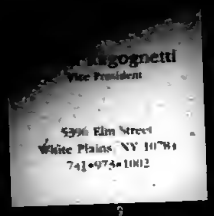

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IS age discrimination cases on the rise

By Thomas Hoffman

When Bob Jolly joined New York-based software developer JYACC, Inc. in 1992 as a 58-year-old senior business consultant, he figured he had another four or five years before retirement. After all, he had received two glowing performance reviews in his first 22 months on the job and was approaching pension age.

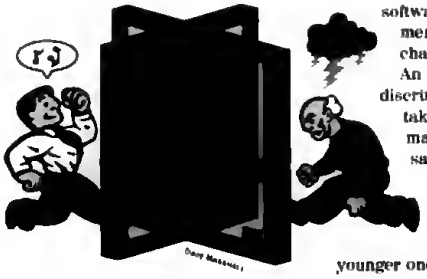
But Jolly's plans took a sharp detour three months ago when he was laid off from his $59,000-a-year position after JYACC lost a sizable programming contract with AT&T Corp. Jolly said he was one of six JYACC consultants dismissed from the Parsippany, N.J., office between February and May of this year — all age 47 or older and among the unit's most highly salaried employees.

No alternatives

Jolly said JYACC did not offer salary cuts or relocations to any of the older employees released. But at least two younger consultants were offered — and accepted — transfers to JYACC's New York office.

In response, Jolly and his peers joined the growing number of graying systems staffers who refuse to take their pink slips lying down. He and two other former JYACC consultants — John Cullen, 56, and Gil Winston, 47 — plan to file an age discrimination petition against JYACC with the U.S. Equal Employment Opportunity Commission (EEOC).

Recent age discrimination rulings have favored people such as Jolly, according to John Davis, an attorney at Spriggs & Johnson, a Tallahassee, Fla., law firm that specializes in employment discrimination cases. "In two recent cases, it was found that you can't fire someone who falls within the protected age category [over age 40] based on their salary," Davis said.



The number of age discrimination lawsuits has risen dramatically in recent years, according to the EEOC. In 1992, the latest year for which statistics were available, 84 age discrimination lawsuits were filed in U.S. courts. That is a considerable increase from the 105 such actions filed during the preceding seven years.

JYACC "got rid of the oldest people first who were making the highest salaries," Cullen charged. After earning $70,000 a year at JYACC, Cullen said he is now struggling to make ends meet with three jobs, including a part-time sales position at real estate agency Century 21 in Somerset, N.J.

An attorney for JYACC said the software developer would not comment before reviewing the charges being made against it.

An increasing number of age discrimination actions are being taken by older, displaced information systems staffers who said their jobs are being gobbled up by lower-paid whiz kids. Many downsizing companies are replacing older employees with younger ones who have more desirable job skills in areas such as client/server application development, object-oriented programming and Unix training.

"If an employer can show that the employees they selected to stay were more flexible and had better skills than those who were let go, then the employer is better equipped to defend against one of these [discrimination] claims," said Judy Malone, a partner in labor employment law at Palmer & Dodge in Boston.

Other age discrimination actions are mounting. Thirteen former IS employees at Bell Atlantic Corp., who lost their jobs three months ago as a result of companywide data center consolidations and organizational restructurings [CW, Aug. 22], will soon file charges of discrimination with the EEOC, according to Peter van Schaick, a Glen Ridge, N.J., attorney, who is representing them. Van Schaick, who also represents Jolly and the former JYACC employees, said older IS employees at Bell Atlantic took a significantly heavier hit than younger staffers. A Bell Atlantic spokeswoman declined to comment.

Adrienne Leone, a 63-year-old business systems analyst at Merrill Lynch Insurance Group Services in Jacksonville, Fla., was "reorganized" from her position last summer. Before her dismissal, Leone had a strong performance record and received promises of a near-term promotion to oversee a division that manages the security of the databases used by Merrill Lynch's field insurance agents, Davis said.

Merrill "told Adrienne her position was being eliminated, and two weeks later, [Merrill Lynch] advertised for practically the same position," Davis said. He claims that Leone was quickly replaced by a much younger and less experienced woman.

Earlier this month, Leone filed an age discrimination/wrongful termination suit against Merrill Lynch in U.S. Circuit Court in Jacksonville. A spokeswoman for Merrill Lynch declined to comment on the case.

Proposed national standards network to ease development

By Gary H. Anthes

Two standards giants joined together last week to create a network of distributed databases that some users said will reduce paper-handling costs and speed product commercialization by accelerating standards development.

The National Institute of Standards and Technology (NIST) and the American National Standards Institute (ANSI) said they will spend some $10 million in five years to link the databases of about 400 standards development bodies into an information retrieval system dubbed the National Standards Systems Network (NSSN). The idea is to provide users, via the Internet, a user-friendly, unified view of the standards world.

Technical standards to be made available on-line include those for ensuring software compatibility, consumer product safety, manufacturing, product testing, quality and many others.

Getting ready

About 90 organizations — both end users and standards development bodies — are already planning for the NSSN, said David Crammer, an associate director at NIST's Manufacturing Extension Partnership. He said the technical architecture for the NSSN has not been worked out, but developers hope it can be built using currently available technologies. He said a system design will be completed in a year, and a design group will meet in Washington the week of Sept. 26 to begin fleshing out details.

"Standards don't add directly to our profits, but they enable our engineers to do the job right the first time," said Robert Noth, manager of engineering standards at Deere & Co. in Moline, Ill. "So standards are important to the velocity of product design, and [this network] will give us faster access to that information."

> The idea is to provide users, via the Internet, a user-friendly, unified view of the standards world.

Deere uses technical standards from 50 to 60 organizations, which are received and distributed on paper to company sites worldwide, Noth said. He said the NSSN will initially allow Deere to collect this information electronically for maintenance in local company databases; it will speed access and reduce errors and paper-processing costs.

Eventually, Noth added, Deere will eliminate its internal databases and use the NSSN to access standards organizations' databases, which will be available through subscriptions.

Crammer said much of the $2 million funding for the first two years will go toward creating a system design while reaching consensus among the parties involved. "I suspect we'll find areas of real conflict," he said. "There are so many parties and so many different perceived needs." Much of the remaining effort will focus on finding ways to streamline the standards drafting and approval processes, Crammer said.

Crammer said standards developers will automate their paper systems and make them available on the Internet at various times in the next five years using Internet cataloging and search-and-retrieval tools such as Mosaic and World-Wide Web. He said he hoped that eventually users will be able to pay for the information electronically.

The Boeing Co. in Seattle has 6,000 internally developed standards and an additional 50,000 external standards stored on microfilm and CD-ROM. Making matters even more challenging, the company must keep track of two sets of standards — one for military production and one for commercial products.

Paul Mercer, Boeing's senior manager of external product standards, said the NSSN will provide a unified front end for the standards. "Say I'm out in the shop working on an airplane assembly. I'll go to my workstation and bring up an engineering drawing and in one corner will be a reference to one of our standards. That references an ANSI standard, so now I gateway to the NSSN and bring that in," he explained.

Easing the process

Mercer said the NSSN will also help standards bodies streamline the cumbersome process by which draft standards are developed, revised and approved. He said the hope is that electronic mail, teleconferencing and other automated aids will reduce the three years it typically takes to develop a standard — by 50%.

Dianne E. Kelly, program director at ANSI, said a goal of the project is to code documents with standard, generalized markup language, which is a way to tag words and sections in a document to define their purpose. That would allow "hyperlinking" across databases, she said. For example, it would allow databases of all standards dealing with open systems to be linked, Kelly said.

Kelly said standards developers will continue to maintain their own databases, but there will be a central cataloging and routing system.

"Right now, because of the distributed nature of the information, it's difficult to locate, especially at three in the morning," she said.

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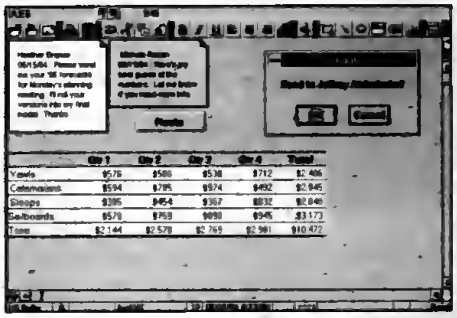

1-2-3's Range Routing lets you share data with colleagues—sequentially or all at once—collecting their comments and input into a single document.

Plus, unlike other spreadsheets, 1-2-3 can designate particular ranges for comment or review by particular users, rather than routing the entire worksheet. Range Routing lets you mail the spreadsheet range to workgroup members for input, track progress, then roll everyone's ideas back into your file, complete with comments and changes tracked as versions.

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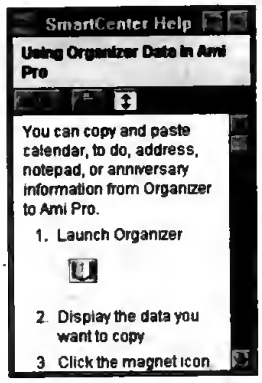

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SmartCenter is always there to help you launch applications or switch between them. And Bubble Help is right there for you–all you do is point.

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Fast Format
(apply styles throughout documents)

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(for easy one-step installation)

Small Footprint On Your PC
(the most efficient suite available)

1-2-3/Approach Integration
(database power in your spreadsheet)

Lotus NOTES READY

1-2-3 RELEASE 5 SPREADSHEET

SmartMasters
(useful predesigned templates)

Lotus Maps
(geographic visuals of data)

Lotus Approach Integration
(for extra database power)

Smart Assistants
(to guide you)

Range Routing
(for mailing spreadsheet ranges)

Direct Access To Database Files
(open dBASE and Paradox® files directly into 1-2-3)

OLE 2.0 Drag-And-Drop
(move or copy data, with visual mouse cues)

APPROACH 3.0 DATABASE

PowerClick Reportwriter
(for wysiwyg design)

Smart Assistants
(to guide you)

InfoBox
(instant on-screen manipulation)

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Briefs

Siemens ups stake

Siemens Nixdorf Informationssysteme AG to Paderborn, Germany, last week increased its stake in San Jose, Calif.-based Pyramid Technology Corp. from 5.3% to 17.6% with a $17.3 million investment. Siemens also purchased the right to increase its share to 24% by Sept. 30, 1995. Siemens is licensing Pyramid's massively parallel Unix operating systems and will also become an OEM customer of Pyramid's MPP hardware code-named Meshine.

Cascade looks strong

Cascade Communications Corp. in Westford, Mass., reported strong financial performance for its second quarter, ended July 2. The supplier of multiservice wide-area network switches jumped to $8.5 million from $1.3 million in sales during the same period last year. Net income for the quarter was $1.2 million, compared with a net loss of $600,000 for the same quarter in 1993.

Marcam reports loss

Marcam Corp. last week restated its financial statements from 1991 through the second quarter of this fiscal year. As expected, they showed a reduction in aggregate net income of $18.7 million for the period. The Newton, Mass.-based supplier of enterprise applications and services for manufacturing companies also acknowledged that shareholders filed a class action lawsuit against it but denied all allegations in the suit.

SHORT TAKES Canada-based Newbridge Networks Corp., a vendor of global LAN and WAN applications, announced a 49% jump in revenue for its first quarter of fiscal 1995, ended July 30. Revenue was $171.4 million, compared with $115.3 million for the period last year. . . . ICL PLC said it will move its worldwide retail systems division from Bracknell, England, to Dallas.

Metaphor to shut down operations

IBM to absorb technology

By Craig Stedman

One of the pioneers of the client/server decision-support market is about to fall forward with the proverbial arrow in its back.

Metaphor, Inc. will shut down by year's end and merge its operations into two different parts of parent IBM. The Mountain View, Calif.-based developer said it would not have been able to meet 1995 profit goals set by IBM without cutting its 290-person work force by as much as 40%. Such a move would have gutted Metaphor's ability to survive as a separate entity.

Chris Grejtak, president of Metaphor since January, said the future of its Data Interpretation System (DIS) under IBM "is an open question." IBM has committed to supporting the existing releases of the OS/2-based software but has not decided if it will enhance it further.

This was not music to the ears of John Tedesco, director of marketing information systems at Nynex Corp. in White Plains, N.Y. Nynex, which has about 500 employees using DIS for marketing and other purposes, is counting on promised — and already delayed — TCP/IP support, he said.

"I don't want to live with DIS as it is," Tedesco said, adding that not getting a TCP/IP link "would require us to rethink a lot of things." Nynex had been looking to expand its use of DIS into other parts of the company, "but we don't know exactly what we're going to do now," he said.

Future looks bleak

Howard Dresner, an analyst at Gartner Group, Inc. in Stamford, Conn., said he sees no future for DIS, especially because it competes directly with IBM's new Visualizer database query tool. "It's dead," Dresner said, noting that Metaphor was "doing very little in the way of new sales."

DIS was stuck at about 130 customers, and revenue had fallen from a peak of almost $45 million to about $30 million, Dresner estimated. Krystyna Filistowicz, an analyst at Dataquest, Inc. in San Jose, Calif., agreed that Metaphor's business "has been relatively stagnant for quite a while."

Originally based on proprietary hardware, DIS is more expensive and complex than rival decision-support products from Cognos, Inc. and Trinzic Corp., Dresner and Filistowicz said. Metaphor still uses proprietary electronic mail, document editing and spreadsheet technology. DIS was also hurt by ties to OS/2 rather than Windows, Dresner said.

Metamorphosis

Metaphor has been under IBM's wing for the last half of its 12-year history

October 1982	April 1988	February 1990	September 1990	September 1991	January 1994	August 1994
Founded by David Liddle and other former Xerox developers	IBM invests in Metaphor as part of OS/2 development pact	Metaphor exits hardware business; signs marketing deal with IBM	Metaphor and IBM form Patriot Partners to develop object-oriented operating system	IBM buys Metaphor; Patriot Partners dissolved into Taligent	Work force cut 27%; Windows NT project put on hold	Decision made to merge Metaphor operations

Parallan eyes acquisitions despite cuts

By Jaikumar Vijayan

■ Superserver vendor Parallan Computer, Inc.'s woes are not over yet. Just a few weeks after the company scaled back its development, marketing, manufacturing and support relationship with IBM, Parallan announced last week that it will cut its staff by more than 50%.

If the layoffs evoke a sense of deja vu, that is because in April the company was forced to let go roughly 25% of its work force, or about 30 employees (CW, April 18).

The cuts follow three disappointing quarters to which Parallan's revenue was nearly halved, from around $6.5 million in the second quarter of 1993 to around $3.5 million in the first quarter of this year. Besides sluggish server sales, IBM's obligation to pay Parallan a minimum royalty ended in January this year, drying up the company's only revenue source.

Interestingly, however, the drastic pruning has not stopped the company from seeking to acquire one or more high-tech companies that may be related to its current server business. Parallan also said it has created a server software business unit to focus on potential OEMs and licensees for its server boxes.

News of Parallan's acquisition and development plans, even as the company was handing out pink slips to more than half its work force, elicited a mixed response from analysts. They view Parallan's effort as necessary — but somewhat hopeful.

"Parallan may be trying out an alternative business model," suggested Matt Cain, a senior industry analyst at Meta Group, Inc. in Westport, Conn.

Increased competitive pressures in the superserver arena, and the struggle for onetime rivals such as NetFrame, Inc. and Tricord Systems, Inc. to maintain market share in this segment, may be prompting Parallan to look for a niche in vertical segments, Cain said.

Negotiating contracts

Parallan said it has $36 million in cash and equivalents and is negotiating with several vendors of servers and superservers interested to becoming OEMs or licensees of its subsystems.

The company's servers include a remote management system, a multichannel redundant arrays of inexpensive disks (RAID) Level 5 disk array subsystem and an automated server software installation and configuration system.

Parallan's efforts to acquire or license vendors come even as its much-touted 10-year relationship with IBM seems to have reached a premature demise. Under that relationship, announced in June 1992, the IBM PC Co. gained a 12% stake in Parallan, along with exclusive worldwide marketing rights to versions of Parallan's Advanced 290 Server systems.

While previously Parallan has stoically maintained that its relationship with IBM has played according to script, analysts have been unanimous in labeling the short-lived marriage a disaster for Parallan.

At a glance

Parallan Computer, Inc. / Founded in 1988

- **June 1992** — Signs marketing, manufacturing and support relationship with IBM, which gains exclusive selling rights to Parallan's Advanced 290 Server systems
- **April 1994** — Reduces work force to about 90 from 120 employees
- **July 1994** — Reaches a nonexclusivity agreement with IBM on its technology and ends IBM funding of company
- **August 1994** — Reduces work force by 50%, sets up server software business unit and announces acquisition strategy

Client/server Q&A

I was fortunate to speak at a CIO conference earlier this month where the IS brass was asked to list questions they have on everyone's favorite subject — client/server computing.

Following is a sampling of those questions, with a few comments from me in italics.

"The predicted benefits of new technology have often been eclipsed by the never-imagined capabilities they bring. Have any of these arisen in client/server computing?" *Remember the old joke about the IBM salesman sitting on the edge of the bed, telling his partner how good it was going to be? Apply the same logic here.*

"Are the paybacks different? I understand the costs are greater." *Many of the paybacks fall into the "intangible" category, according to those who have had to justify the costs — which are unquestionably greater.*

"How do you identify all the hidden costs and justify the expenditures?" *The question is sadly oxymoronic because if the costs weren't hidden, you could identify them. But they are hidden, and therefore not easily identified. Better to look instead for scar tissue on the flanks of your peers. As far as justifying the outlays, tune in to the next David Copperfield TV special.*

"Will this result in greater IS productivity, output and data accessibility for lower costs?" *This is easy. No.*

"Is it true what I hear — that many client/server implementations take longer, use more resources than expected and are more difficult to manage and support?" *You have excellent hearing.*

"Server crashes, dismounting disk volumes, etc. are ongoing problems [on our LAN] not typically encountered on our AS/400. Is this typical?" *Much of what IS took for granted in the old proprietary world has to be built from the ground up in the new world of open systems — including credibility.*

"What types of client/server applications provide the most attractive benefits and options? And how do support considerations change?" *The answer to the first question is, just about any application that doesn't have the phrase "mission-critical" in front of it. And to the second, support initially multiplies.*

"If client/server is not cost-justifiable, should it be implemented anyway?" *Without question, yes, because eventually you'll have to anyway. So get started now. But don't let anyone tell you that you can take core applications and easily replace them with client/server apps. Wait to consider core application retrofitting until every single client/server vendor (which is just about all of them today) has all of its core apps running in a true client/server architecture. Until then, stay out of deep water.*

Bill Laberis

Bill Laberis, *Editor in Chief*
Internet: *blaberis@cw.com*

Rich Tennant is on sabbatical. This is one of his classic cartoons from 1992.

Title testing

How quickly we forget! It was only a few years ago that some poor "system engineer" in New Jersey was advised that he couldn't legally use the title and went to his state representative to ask for assistance. She apparently misunderstood his need and drafted complex legislation that would have created a licensing board for computer "engineers," complete with licensing examination.

Luckily, the legislation died. But now Tennessee might consider licensing "software engineers" ["Federal law may sanction use of 'engineer' title," CW, Aug. 1]. Here we go again!

Bruce Black
Little Falls, N.J.

Fans tout APPN

"APPN seen headed for obsolescence" [CW, July 18] incorrectly asserts that APPN won't "get off the ground" and that support is conspicuously lacking from router vendors.

It also portrays conflict and confusion between APPN and ATM a la IBM's Broadband Networking Services. But Wellfleet sees APPN and ATM as complementary technologies to address high-speed network requirements. You must remember that APPN is a complete "architecture," not just a protocol, as some would have you believe.

With VTAM 4.2 anchoring the mainframe environment for SNA customers (and research tells us that there are 30,000 or more of them), the time is right to declare APPN ready to address the three SNA Commandments: Reliability, consistent response times and high performance.

David J. Berman
Director, IBM Networking
Wellfleet Communications, Inc.
Billerica, Mass.

"APPN seen headed for obsolescence" is seriously misleading in the following respects:

- Third-party vendor support. Independently of IBM, Data Connection Ltd. licenses well-proven APPN source code to the industry. Vendors that have announced plans based on this code include Cabletron, Hewlett-Packard, Hitachi, Memorex Telex, Northern Telecom, Unisys and Wellfleet. Other major vendors have yet to make their announcements.

Most major vendors already have plans to support APPN, and the availability of this source code makes it easy for others to follow suit. While it is true that APPN has had limited deployment to date, we know from our position with the vendor community that this is about to change rapidly.

- Legacy application support. It is true that IBM has only recently shipped Dependent LU Server/Requester (DLUS/DLUR) in VTAM Version 4 Release 2 (and Data Connection's DLUR feature ships at the end of this month). However, it takes many years to fill in all the features required to meet the complex needs of corporate networks. IBM launched SNA in the early '70s, but it was in the '80s that most corporate users installed SNA-based systems — after some journalists had written off SNA in the late '70s. While DLUS/DLUR has only just been released, it is by far the best option for users who want to run legacy applications over modern architectures. TCP/IP has no comparable feature.

- HPR does not make APPN obsolete. The article implies that High Performance Routing (HPR) makes APPN obsolete, and therefore that APPN has missed a window of opportunity. In fact, HPR is an enhancement to APPN. For corporate users who require effective bandwidth optimization, prioritization of interactive traffic over batch and the ability to route around network failures in a nondisruptive way, APPN with HPR clearly wins over TCP/IP. Many users who have considered moving to TCP/IP are thinking again.

The next two years will show whether your prophecy is right. My company is confidently (and already profitably) betting on APPN's success.

Phil McConnell
Director,
SNA Development Group
Data Connection Ltd.
Middlesex, England

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Woodstock 2.0: Techno-tainment born

Joseph Maglitta

The images of mud, music and moshing have already flashed from memory — human and digital — into the world's electronic scrapbook for further processing. But technology professionals might linger another moment or two and consider the lessons of "Wired Stock."

You ask, "What can a crowd-surfing, tattooed bunch of Generation Xers with nipple rings and soggy hippies teach me (or anybody) about information technology?" More than you think.

Regardless of your feelings about $135 tickets, the wisdom of trying to get "back to the garden," any band called Porno for Pyros, etc., you have to admit that this was one wired powwow.

Think back: Technology at Woodstock 1.0 consisted of a PA system, walls of shaky black guitar amplifiers and some walkie-talkies.

This month's primordial ooze-fest was encircled by an ad hoc infostructure that streamed nonstop video, sound and text to thousands, perhaps millions, of virtual voyeurs around the site and the planet.

It's hard to believe but technology was everywhere: America Online, Prodigy, CompuServe, the WELL and various Internet forums all sponsored interactive Woodstock chats, many of which included on-site festival goers. A six-acre technology farm featured a Surreal Field of virtual reality demonstrations. Portable automatic teller machines even dispensed cash near concession stands.

In the most exciting novelty, a dozen "reporters" from the new Woodstock Online service roamed the Saugerties, N.Y., site, uploading on-line chat fodder to home viewers via laptops and cellular fax modems.

Apple — the festival's "official computer" — produced a twice-daily multimedia newspaper.

And of course, pay-per-view television provided visual icing on the funky, homemade, oh-my-gosh-I-think-I-see-the-info-superhighway! multimedia cake.

It hardly matters how well this worked; entertainment and technology became tentmates at Woodstock 2.0. Their silent partnership brought the digitized source code also known as "reality" to everyone who wanted (and could afford) it. It bypassed those who didn't.

Computers, amazingly, were ubiquitous, visual but hidden, exciting and, most of all, fun. Technology was the stage crew, not the star.

Should your organization expand a view of computing that might be one-dimensional, circa 1969? Should you combine on-line forums, video and/or portable systems into new, easily accessed forms for employees, customers, students, regulators or volunteers? Is there a meeting or company event at which you should wire up attendees and distant onlookers? No one's looking. Think CNN, Nintendo, rock 'n' roll and *Star Trek* for a few minutes and watch the ideas spill out.

You'll find plenty of open-minded new users. Thanks to hippies, the past 25 years have borne a generation who no longer regard computers as evil tools of the "military-industrial complex." They see technology as an entertainer, servant, appliance — maybe even friend or lover.

For better or worse, many dreams of the original Woodstock (ecology, free sex, eating vegetables, rock music, drugs, etc.) took root in larger, more fertile fields because they ultimately seemed like good ideas to Joe or Jane Average.

It's a new dawn, with fresh mud.

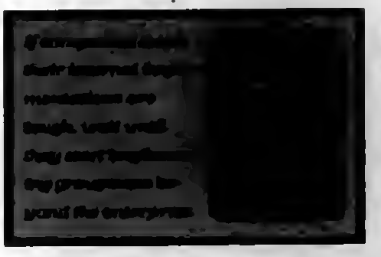
Maglitta is *Computerworld*'s senior editor, corporate strategies.

Groupware griping is premature

Michael Schrage

To hear the carping about "culture, culture, culture," you'd swear you were at a conclave of anthropologists and sociologists instead of the annual GroupWare '94 conference in San Jose, Calif., earlier this month.

Even the most antisocial of the technogeeks sounded like Multimedia Margaret Meads when describing the challenges in bringing groupware to their organizations. The speakers all repeated groupware's greatest cliches: "Cultural barriers to implementation are greater than technical barriers." And "Without careful planning, stubborn organizational resistance consistently triumphs over the most brilliant technological initiatives" and so on.



Adapting groupware to the enterprise is more often a living nightmare of cultural engineering than a strategic exercise in network installation.

Alas, this groupware gripe is shockingly myopic. It betrays a misunderstanding of groupware's true destiny. If companies think their internal implementations are culturally tough, wait until they start implementing groupware beyond the enterprise. To paraphrase Al Jolson, "You ain't networked nothin yet . . ." Smart companies know it is necessary to link with their best customers, clients and suppliers. Groupware will evolve as much as a medium *between* organizations as *for* them.

The cultural obstacles to interfirm implementations will make today's challenges of intrafirm adoption seem ridiculously tame. If getting an internal consensus on groupware is similar to herding house cats, creating external groupware networks will be similar to herding lions, tigers and cheetahs. But successful, cross-organizational/cross-cultural groupware implementations will require such external relationships.

A Big Six accounting firm wants to extend its Lotus' Notes network to a key auditing client. That way, sharing ideas and Internal Revenue Service interpretations becomes a snap. Spreadsheet queries and budget updates become more of a dialogue than an interrogation. It's a better medium for client relationships. But who maintains the Notes site and the integrity of its data? The accounting firm or the client? Does the Big Six accountant offer a discount to the client for becoming part of its network? Or should it try to bill extra?

Or, more provocatively yet, suppose the Big Six client insists its auditors become a part of *its* Notes Net? Whose network is it anyway?

Clearly, it's ridiculous to think that organizations with different values about public and proprietary information are going to come to swift accommodations over these kinds of questions. The rise of cross-cultural groupware shifts the design challenge away from the integrity of the network and data to the integrity of the organizations and their employees.

The sorry reality is that what organizations learn from their internal implementations of groupware is unlikely to be easily exportable to their clients and suppliers. Unfortunately, I am highly confident that efforts at groupware imperialism will emerge. We should instead look for the emergence of interfirm groupware to foster new kinds of economic lures and incentives to get companies to computationally collaborate.

Schrage is a fellow at the MIT Sloan School Center for Coordination Science and the MIT Media Lab. His Internet address is schrage@media-lab.mit.edu.

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The Gartner Group estimates the cost is about sixty dollars a desktop. Even in an enterprise of just twelve hundred PCs, that's a bill of seventy-two thousand dollars.

Once installed, there is no way to measure the efficacy of the security. Enforcing user compliance is difficult at best. Security policies are often ignored. Basic measures like simple password security are notoriously difficult to enforce among your users.

And many security systems are inherently weak. Anyone with a start-up disk can subvert your efforts and walk off with whatever data that strikes their fancy.

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DiskLock provides you with virtually unbreachable security with three levels of workstation protection. Password access to all of your users' desktop computing resources. File locking to conceal and protect confidential files. And two levels of data encryption to scramble sensitive information: DES, the official United States Government Encryption Standard, for highly-sensitive files, or our own Symantec Proprietary Encryption algorithm.

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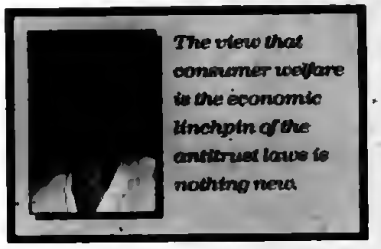
Antitrust is alive, well and relevant

Susan G. Braden

Recent headlines in the compnter press highlight the heightened profile that federal antitrust enforcers have assumed in the computer industry.

While a beleaguered, if not bewildered, Bill Gates ofteo appeared to be the focus of these efforts, the government's activities, in fact, have beeo far-ranging. The activities include the Antitrust Division's challenge of the ChipSoft/Mega merger, a consent decree settling price-fixing allegations in computerized airfare data exchanges, the Federal Trade Commissioo's divestiture order in the Adobe/Aldus merger and the division's Aug. 8 release of proposed Intellectual Property Guidelines.

Central to the merits of all of these actions is the underlying question of whether antitrust laws are relevant in an industry where market shares are at best transient and perhaps illusory.



The view that consumer welfare is the economic linchpin of the antitrust laws is nothing new.

The 1890 enactment of the first antitrust law, the Sherman Act, resulted from populist sentiment that market dominance wonld necessarily translate into political power that could bypass the will of the majority. Thus, the act was written to prohibit "*every contract*, combination ... or couspiracy in restraint of trade or commerce" and rendered "every person who shall monopolize ... any part of trade or commerce" liable for unlawful conduct. The antimerger taw, the Clayton Act, and the "unfair methods of competition" law, the FTC Act, were also drafted in broad and general language.

Congress, however, wisely left the parameters and content of the antitrust law for the courts to determine. In 1897, in its first antitrust case, the Supreme Court immediately elarified that the law applied only in "unreasonable" restraints of trade, imposing a qualitative standard consistent with the objective of Sen. John Sherman, who wanted to make business arrangements unlawful that were "designed or which tend to advance the cost [of products] to the consumer." Thus, the view that consumer welfare is the economic linchpin of the antitrust laws is nothing new.

That objective had long beeo recognized by the courts, and since the Reagan administration, by the federal antitrust authorities as well.

Despite some recent misplaced rhetoric to the contrary, it is not unlawful for a company to be or have a monopoly in any market unless consumers are harmed. That has been made clear by the U.S. Supreme Court, which in 1984 specifically recognized the need to protect the "competitive zeal" of the entrepreneur. Io 1993, the court reaffirmed that the antitrust does not prohibit "conduct which is competitive, even severely so, but against conduct which ... destroys competition."

There is no qnestion that these "rules of the road" constrained Assistant Attorney General Anne K. Bingaman from suing Microsoft for activities that some of its competitors considered anticompetitive or "unfair."

The software mergers challenged in the Clinton administratioo were analyzed nnder the Merger Guidelines conceived during the Reagan administration and revised under the Bush administration to be an internal analytical tool for the agency staff. The guidelines, however, are not the law and need further refinement when applied to the computer industry, particularly software mergers.

The government would likely have prevailed in prosecuting the focused Microsoft complaint that was issued, but it would not have won the case that some in the industry wanted. Nor would it heve won the merger cases because it is difficult to see how consumer welfare would have been harmed in either of these instances.

Casting the sole vote not to block the Adobe/Aldus merger, departing FTC Commissioner Deborah Owen issued an overbroad but likely prophetic statement. "Perhaps the day will come when federal antitrust enforcers will be forced to prove their skewed version of the computer software industry ina federal judge. I suspect when that day comes, they will not prevail," she said.

The challenge for the courts is to keep the antitrust law relevant; the challenge for the industry is to keep itself competitive; and the challenge for consumers is to continue picking the winners and losers rather than allowing the government to make that choice.

Last year in oversight hearings on competition in the computer industry, a panel of diverse experts testified before House Jndiciary Committee Chairman Jack Brooks. The opinions expressed are fairly summarized by one witness' observation:

"The American [computer] industry is by any measure extremely dynamic and extraordinarily competitive. It neither needs nor seeks any special antitrust exemption."

That witness was from Microsoft, and he was right. Antitrust is alive, well and relevant in the computer industry.

Braden is a partner in the Washington law firm Ingersoll and Bloch, Chartered. She was a senior trial attorney at the U.S. Department of Justice Antitrust Division from 1973 to 1980 and served at the FTC from 1980 to 1984.

Watch out for bumps on client/server road

Jonathan Bines

So you finally decided to join the stampede to client/server computing, lured by the promise of greater flexibility, cheaper hardware and software and improved responsiveness to your users' demands.

Fine, I won't try to stop you. You're undoubtedly aware of the challenges that swait you: the hardware interoperability problems, the difficulty of converting or rewriting applications, the managemeot headaches. However, some potholes remain on the road to client/server that yonr vendors may have neglected to tell you about.

- **Performance plummets.** Wait a minute here. Wasn't a key benefit of client/server supposed to be improved performance? In theory, yes. In practice, it isn't necessarily so. Moving data In relational databases using SQL often results In application speeds well below those of old-fashioned databases for simple transaction processing. In one recent debacle, a multimillion-dollar project was scrapped in part because telephone operators had to wait 35 seconds for each response to a SQL-based query.

Worse, some SQL implementations limit the number of indexes, forcing lengthy full-file scans for simple queries that don't rely on existing indexes. The usual solntion is to throw more hardware at the problem, thus eating np your potential savings from downsizing.

- **Security is a joke.** First, using a client PC for program logic opens op a system to manipulation by aggressive PC programmers. This rarely bothers project managers until auditors arrive In check the application. Then months of delay ensue while all the critical application logic is moved from the client to the server where the data can be better protected. The second problem occurs wheo the users use Unix. Unix requires the designation of a superuser to perform many administrative functions. Superusers have access to all system resources and can wander freely.

The best defense against embarrassment caused by these challenges is to admit them up front.

- **Staff costs skyrocket.** IS organizations are accustomed to paying operations people wages similar to those of skilled technicians. But Unix and networking administrators are in such short supply that many command the salaries of doctors and lawyers. It won't be long before mothers start urging their kids to become systems administrators. In San Francisco, a systems administrator with two years of experience will run you $70,000 per year. Multiply that price by the number of remote sites that must be administered and the number of years a project is to run. Scary, isn't it?
- **Standards don't result in portability.** Vendors will tell you how excited they are to be adhering to all the open systems standards — SQL, TCP/IP, Posix, SNMP, Motif, etc. Then they lock you inin their platforms by selling management applications that run well only on their equipment.

Innovative companies have found sointions to each of these problems, but not without difficult and time-consuming trial and error. The best defense against embarrassment caused by these challenges is to admit them up front and ensure that top management is aware of the uncertainty in time and cost for your client/server projects.

Bines is editor of "The Network and Systems Managers' Best Practices Report" in New York. He can be reached at jbines@panix.com.

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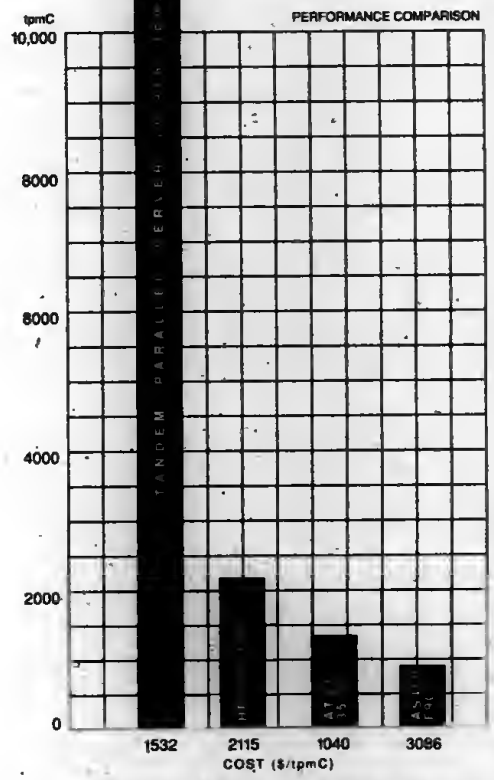

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Datamation, June 1, 1994

Thus, in the interest of friendly competition and greater service to all customers, Tandem issues the following challenge: "If, before July, 1995, *any* vendor using *any* SQL relational database on *any* hardware platform can demonstrate higher than 20,918 tpmC at a better price/performance than that shown by Tandem's Himalaya K10000 parallel server TPC-C benchmarks, Tandem will donate $20,918 to the charity of that vendor's choice."

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10 Total Slots	7 Total Slots
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Carole Patton

Upgrades are a hard sell

How do you spot a watershed computer product — one that sends users down an entirely new road? Easy. It creates a market that didn't exist before. More importantly, when that watershed product is software, it invariably requires users to go out and buy a lot more hardware.

Think about it. PCs were bought en masse because spreadsheets — Lotus' Visicalc and 1-2-3 — transformed a toy into an accepted business tool. The debut of 1-2-3 was a turning point. It legitimized the PC. IBM then sold millions of them and in the process created a huge market for clone makers such as Compaq and Dell. It also whetted an enormous new appetite for hardware.

Windows 3.x created another hardware bonanza. That's because every time Windows developers came out with new software, they added features and thus increased the hardware requirements. I recently looked at the system requirements listed on the boxes of 50 Windows business applications and found that a Windows application upgrade generally requires twice the amount of RAM of the previous version.

For example, Microsoft Word originally required 1M byte of RAM. When Word 2.0 hit the shelves, 2M bytes was the recommended minimum. And in January, when the third version, 6.0, shipped, the recommended RAM minimum doubled again to 4M bytes. That's a 300% increase in RAM requirements in three years!

Not just RAM

Hard disk requirements also grew with every Windows application upgrade. Norton Desktop 1.0 originally required 5.5M bytes of free disk space for a full installation; Norton Desktop for Windows 2.2 needed 11M bytes; and the latest version, 3.0, expects a whopping 15M bytes of free disk space!

What's more, Windows applications required processor upgrades (the stated minimum now seems to be a 386) as well as video upgrades.

Additionally, Windows created a market for a new add-on board — Windows accelerators — and made the lowly mouse indispensable. The good news is that users are now ready for the 32-bit world, provided the corporate coffers are prepared to pay for it.

Without Windows, IBM could have waited years for a large installed hardware base capable of running OS/2 to come along. Check the requirements of today's DOS applications and you'll still find the same old "IBM AT, PS/2 or 100% compatible" and "IBM color graphics adapter" listed as minimums — ironic considering the Justice Department's recent consent decree that labeled Microsoft "monopolistic" and guilty of practices that restrain trade. In a competitive industry, Microsoft may not be Mr. Nice Guy, but our attorney general needs a fast lesson in what I'll call PCnomics 101.

True watershed products are as rare as snowy owls. But Lotus may have done it again: The inclusion of a demographic mapping function in Lotus' 1-2-3 Release 5 for Windows, which shipped earlier this month, will certainly make it a candidate. The new mapping software in 1-2-3 will go a long way toward creating a giant market for databases. What

Patton, *page 46*

Parity of graphics features stirs application suite competition

By William Brandel

When PC-based graphics presentation applications first hit the market, their appeal and success depended on how well they helped an end user paint a pretty picture. Because feature parity permeates the graphics software arena today, pricing and packaging have as much to do with an application's success as its features do. For Software Publishing Corp., this has not created a pretty market picture.

In recent weeks, new versions of three of the four major PC-based graphics applications have been introduced. Lotus Development Corp. has begun shipping Freelance Graphics Version 2.1, Software Publishing has rolled out Harvard Graphics 3.0 and WordPerfect Corp., Novell, Inc.'s Applications Group, has announced Presentations 2.0. Microsoft Corp.'s PowerPoint was refreshed earlier this year.

Suite advantage

Suite vendors dominate the Windows-based graphics software market

	Units shipped 1993
[illegible]	[illegible]
Lotus' Freelance	399,400
[illegible]	[illegible]
Aldus' Persuasion	19,600
[illegible]	[illegible]
Other	25,000
[illegible]	[illegible]

Source: Computer Intelligence/InfoCorp, La Jolla, Calif.

On the shelves

The upgraded applications are Windows-based. Freelance and Harvard Graphics are already shipping; WordPerfect officials said Presentations will hit the market when the company's new PerfectOffice suite, expected sometime this fall, is delivered.

Each vendor is trying to leverage its respective desktop and connectivity architecture strategy to expand appeal for users. For example, Lotus is trying to leverage Freelance's connectivity to Notes by touting its support for Notes FX 1.1. This enables the end user to store graphics files in the Notes database repository. WordPerfect's Presentations supports Novell's Open Document Management application programming interface as well as the NetWare Navigator.

On the outside

For the most part, however, the applications are more alike than different. All offer help keys for users as well as file filters to let users call up a graphics file created in a competing application. This feature parity means that the success of graphics applications, much like that of word processors, is tied to the suite that contains them. That leaves Harvard Graphics the odd application out: Freelance is part of Lotus' SmartSuite and Presentations will be part of the PerfectOffice suite.

"We know that we can't compete head-to-head with the suites," said Chris Randles, vice president of marketing at Software Publishing. "We have to find a way to adapt to a market where suites are still the most common way to buy applications."

Graphics, *page 46*

Security distinguishes notebook package

By Michael Fitzgerald

WizardWorks Group, a Minneapolis software developer, has introduced Notebook Companion, a utilities package designed for portable users.

Notebook Companion combines a variety of software utilities designed to make notebooks more useful, such as a built-in battery gauge and an expense report package.

Re/Max's Bruce Benham *finds security features attractive*

One information systems manager said the product could be useful, though his users would not need all the components. He said he would be interested specifically in the Information Security System, which includes user-defined password protection for hard drives, a virus checker and a program to track terminate-and-stay resident programs.

"The security features make that package sound interesting," said Bruce Benham, vice president of information systems at Re/Max International, Inc. in Englewood, Colo. Benham said Re/Max agents use a homegrown, real estate-specific application that also handles functions such as scheduling. He said he would have to know more about Notebook Companion to assess its value to his organization. Re/Max has 38 regional offices and 2,300 real estate sales offices.

In addition to the security features, Notebook Companion includes the following main utilities:

- Battery WatchPro for Windows, a battery gauge and monitor that discharges nickel cadmium batteries fully to prevent the infamous battery discharge problem.
- Schedule Works for Windows, a calendar program and scheduler.
- Expense Wiz for Windows for tracking expenses on the road.

Game time

IS managers may not appreciate one feature in Notebook Companion: the Notebook Game Pack for Windows, which has seven games.

Notebook Companion sells for $59.99. It requires 6M bytes of hard disk space, 4M bytes of RAM and Windows 3.1.

Graphics

CONTINUED FROM PAGE 45

Randles said Software Publishing will focus on electronic graphics tools and componentized graphics software in an effort to stand apart from the suites as a best-of-breed application.

That is easier said than done. While the major vendors would not provide a specific breakdown of sales, they acknowledge that there are clearly more graphics applications shipping in suites than alone (see chart, page 45). The net effect of suite buying patterns is that the graphics applications market has gone from double-digit to single-digit growth in the past year alone, said Joan-Carol Brigham, an analyst at International Data Corp. (IDC), a Framingham, Mass., market researcher.

"Whether they know it, or whether they even like it, most people are now getting their graphics application as part of their company's suite purchase," Brigham said. "Whether they actually use the application is another issue."

Still, the independence of the graphics application user buoys Software Publishing's hopes to remain viable in this market. While suites have indeed slowed Software Publishing's revenue growth, Harvard Graphics continues to hold its own in the stand-alone market.

In fact, Harvard Graphics holds a 29.2% stake, the second largest in the worldwide stand-alone Windows-based presentation graphics market, according to IDC. Freelance holds down 29.8% of the market, and Presentations has a 6.4% share. And while Microsoft's PowerPoint holds 26.6% of the stand-alone market, it dominates the rest of the market because of suite sales.

Fierce competition

While WordPerfect has the smallest market share, it also seems to have the biggest appetite. In a recent marketing tour, company officials trained their sights on the Harvard Graphics customer base to gain market share. Noting a large installed base of Harvard Graphics applications at WordPerfect sites, WordPerfect officials said they would ship specific filters for Harvard Graphics and offer upgrades that target Harvard Graphics users.

Noting a fair degree of customer loyalty, Brigham said past raids into Software Publishing's customer base have not been all that successful.

"I use Microsoft Word, Excel, Paradox for Windows and Harvard Graphics," said Terry Brewster, a communications engineer at AT&T Corp. in Vienna, Va. "As long as it remains easy to use, I will use" Harvard Graphics, Brewster said.

Patton

CONTINUED FROM PAGE 45

you map depends on your needs and your information database. You might use the mapping feature with census data to analyze everything from voting patterns to distribution routes to automated teller machine locations. With a geographic database you can map migration routes, mine pockets of skilled labor and track seasonal consumer sales.

New to the desktop

Mapping software has been around for 25 years or more, but during most of that time it ran only on mainframes and cost megabucks. The mapping function in 1-2-3 is actually a software engine that Lotus licensed from Strategic Mapping, Inc. in Santa Clara, Calif., the current leader in desktop mapping software. Strategic Mapping virtually gave away its software in order to make money selling information — the economic, demographic and geographic databases it acquired last year from Dun & Bradstreet that it plans to distribute on CD-ROM. "Give away the razor, sell the blades" is a time-honored marketing strategy, but it always works.

Strategic Mapping isn't the only company in the business of selling desktop mapping software. MapInfo Corp. in Troy, N.Y., and Environmental Systems Research Institute in Redlands, Calif., also sell it, though neither had the foresight to launch itself into the database market. Of the three, only Strategic Mapping anticipated tomorrow's burgeoning demand. Of course, judging from experience, 1-2-3's desktop mapping function will sell a lot of hardware, too. So get ready.

Soon you'll be adding more memory, more storage and, of course, a new CD-ROM drive to your hardware collection!

Patton is chief analyst at Mendham Technology Group in Mendham, N.J., and produces summits on new computer technologies. She is the author of *OS/2 Secrets* from IDG Books and publishes the "Windows Letter" newsletter. She can be contacted via MCI Mail at 401-4869 or CompuServe at 73700,2503.

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Briefs

Apple, Claris team on rebate

Apple Computer, Inc. and Claris Corp. said they are offering $750 rebates through the end of the year on simultaneous purchases of Apple's PowerPC-based Workgroup Servers and Claris' FileMaker Pro Server software.

Advanced Logic evolves

Advanced Logic Research, Inc. is marking its tenth year in the PC business by introducing its new Evolution X family of desktop systems. The systems, based on Intel Corp.'s 1486 and Pentium processors, will feature XT/AT and Peripheral Component Interconnect (PCI) bus architectures, full plug-and-play capabilities, 64-bit PCI graphics with 24-bit color and up to 2M bytes of dynamic RAM. The product introduction will also include a 90-MHz Pentium model with either a 420M-byte or 1G-byte hard drive that will hit the market with a starting price tag of $2,995.

IBM VP promoted

Lois Dimpfel, long a mainstay of IBM's OS/2 effort, has been promoted to vice president of development for the company's Networking Software Division in Raleigh, N.C. John Schwartz has been appointed to fill Dimpfel's previous post as vice president for the Personal Operating Systems division and director of the Boca Programming Center in Boca Raton, Fla., a company spokeswoman said.

Travel network upgrades

Sabre Travel Information Network has introduced TurboSabre, a Windows-based point-of-sale product designed to eliminate cryptic format entries in the Sabre computer reservation system used by travel agents and corporate travel managers. Sabre plans to begin shipping the software early next year.

Energy Dept. buys EEPROM

Westinghouse Electric Corp. has begun delivering the first radiation-hardened 64K-bit electronically erasable programmable read-only memory (EEPROM) chip. The U.S. Department of Energy's Sandia National Laboratories will use the chip in satellite and nuclear weapons.

ATI announces Winturbo

ATI Technologies, Inc. has announced its Winturbo board, a 64-bit graphics card priced at $369.

Warranty gets extension

Zenith Data Systems has added its name to the short list of vendors that offer a three-year warranty on notebooks. It added the longer warranty to Z-NoteFlex systems sold since July 1. Certain servers and desktops will also be covered under a three-year warranty. Users who purchased versions of these products before July 1 can get three-year service for a $75 charge. Zenith Data also said it was trying to gain another 400 to 600 resellers.

Toshiba, XcelleNet join

Toshiba America Information Systems, Inc. signed a marketing partnership with XcelleNet, Inc., a maker of remote connectivity and development tools. Separately, Toshiba said it is shipping its T2400C Satellite notebooks, including a model with a 320M-byte hard drive.

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Mining nuggets of technology

Management tool, network will help two staffers service 500 PCs across milewide site

By Jean S. Bozman

The Barrick Goldstrike Mines, Inc. gold mine is so far from civilization that the delivery truck has to drive more than 50 miles out past Elko, Nev., to deliver express packages.

Hardly a typical information systems site, the large Canadian-owned gold mine is located next to a vein of pure gold called the Carlin Trend that lies next to the Sierra mountains here. The rich vein produced more than 1.4 million ounces of gold last year for Barrick.

But being remote has not protected the IS group at Barrick from a challenge faced by every other IS organization that supports hundreds of users — having to upgrade its computers. In fact, the mine site is so large that it has been difficult for just a few technicians to make the rounds when upgrading PCs with new software. The task usually takes 15 minutes at each PC, but traveling to each desktop in 15 buildings scattered over a one-mile campus is time-consuming.

"All these sites are not in one building, and I only have two technicians to service all of them," said Gary Duffy, senior director of financial services and the top IS executive there. "Right now, they have to go to each [PC] box, but we will [soon] be able to install [software] from a central site." Barrick's IS staff numbers six, including Duffy.

Barrick is installing SunSoft, Inc.'s PC-NFS 5.1, which shipped in May, to allow central site administration of the 250 on-line PCs. Another 250 stand-alone PCs will eventually be added to the enterprise network. The IBM-compatible PCs, running MS-DOS and Windows 3.1, will join more than 60 Sun Microsystems, Inc. Unix workstations and 65 Tektronix, Inc. X Window System terminals on the enterprise network.

The move to Unix

Changing computer systems is nothing new to Barrick. The mine ran its financial applications on an IBM System/36 minicomputer until late 1992, when it installed two Sun 690 Unix servers that ran Oracle Corp.'s Oracle 6.0 database and Oracle Financials applications. Besides financial applications, the site's Sun servers run a truck maintenance application, and scientific and geologic applications run on the 60 workstations.

By January 1993, PC users and Unix workstation users finally saw the same things on their screens.

"We had to step up to something because we didn't have enough capacity," said John Parker, chief accountant. "There were little pockets of computers around the mine site. It was obvious that everyone was heading in their own direction." Now, he said, everyone is on the same network with the same set of software applications.

Growth at the site has again forced a server upgrade. Two six-CPU Sun SPARCserver 1000s were installed to run a new production Oracle 7 database, which came on-line July 25. At the same time, Barrick is upgrading PC LANs from PC-NFS Release 5.0 to 5.1 running on two Sun SPARCstation 2 workstations. As the two SPARCserver

Workstations *helped the Barrick mine account for the 1.4 million ounces of gold it mined last year*

1000s become the major production machines, the Sun 690s will serve up PC applications and support electronic mail, users said.

The combination of TCP/IP network protocols and the PC-NFS software, which began in 1992, allows IS managers to store all corporate applications on its Unix server systems. The advantage is that new releases of PC software, including Lotus Development Corp.'s 1-2-3 Version 4.0 for Windows, Microsoft Corp.'s Excel Version 5.0 for Windows and WordPerfect Corp.'s 6.0 for Windows, can be maintained in one place.

Response time for the networked PC applications is good because they are connected by fiber-optic cable that crisscrosses the campus.

"A lot of people assume that because it's a Unix system, you need a Unix device to run on the network," said IS staffer Dan Sullivan, one of the two on-site computer technicians. "Users are finding out they don't have to buy a Sun workstation or an X terminal to get onto the network. They can use their PCs."

Centralized data

Users can access Unix or PC applications maintained on central servers — and their PCs can be managed from central consoles by just a few IS technicians. Barrick also plans to install SunSoft's upcoming SolarNet PC administration tool, which will add icon-based management of remote PCs, users there said. Ed Lazzari, who is both Unix administrator and Oracle database administrator, said PCs can download Unix, DOS or Windows 3.1 files from central Unix servers.

Parker said all the complex software is well hidden. "It's invisible to me," he said, adding that the financial applications he uses can be accessed from PCs or Unix machines. "You could walk across the hall and log on to a Sun [workstation], and you'd end up in the same place and not know there was anything different." Unix users can pick up Unix versions of the Lotus and WordPerfect applications to match those on the Windows PCs.

ON SITE

[illegible]

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AT&T to offer three ports in bid for NT market share

By Mary Brandel

When you think Microsoft Corp. Windows NT Advanced Server, do you think . . . AT&T Global Information Solutions?

That is what AT&T GIS is aiming for. And as part of its effort to be the primo NT server supplier, it recently joined with Microsoft to announce future NT ports of three of its currently Unix-based software products.

So far, the company has worked itself into a leadership position with NT among its large-system brethren. Digital Equipment Corp., Sequent Computer Systems, Inc. and Unisys Corp. are also strong NT supporters. But "it's fair to say that AT&T is Microsoft's lead partner in terms of getting into big accounts," said David Card, an analyst at International Data Corp. in Framingham, Mass.

AT&T's NT server sales in the first quarter of 1994 were equal to all of its 1993 revenue for the same product line, according to Keith Carlson, AT&T's director of marketing for Windows NT. "We're even more pleased with the second quarter," he said.

The company's mission is to fill in the gaps that have kept NT from appealing to those in search of an enterprise-level operating system.

NT time

AT&T led the large-systems vendors in the NT server hardware market

AT&T GIS	$46M
Digital	$28.9M
Sequent	$[illegible]

Source: Dataquest, Inc., San Jose, Calif.

Sea-Land Service, Inc. had a simple qualifier for the NT hardware vendor choice: "If it didn't support software from a high level, we didn't want to touch them," said Edward Tuosto, director of terminal automation support at the Liberty, N.J.-based transportation company.

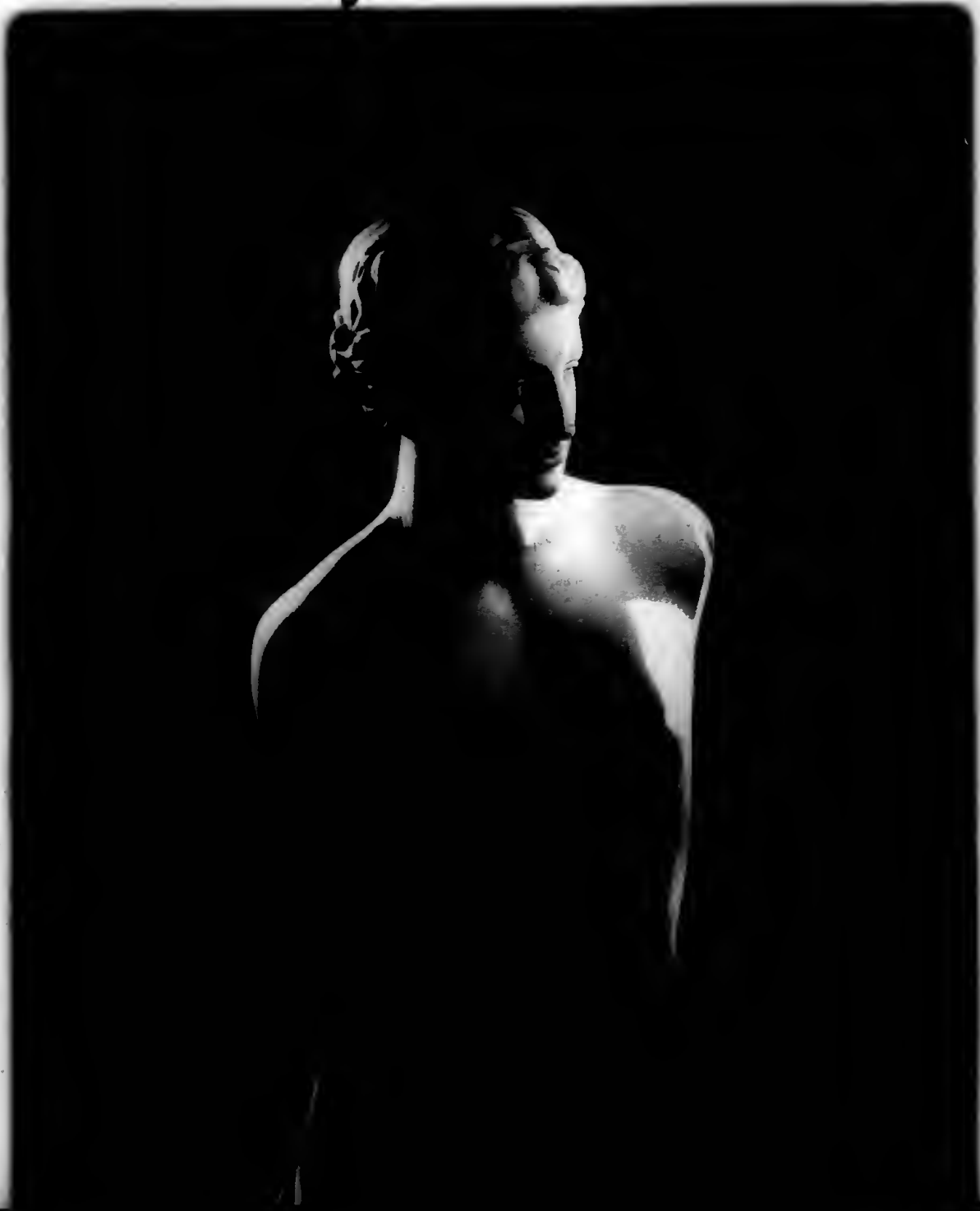
So far, Tuosto is pleased with his choice. When he had a compatibility problem, "AT&T took the lead. They brought the unit into their location and tested it with the software vendor. They really went overboard," he said.

Software ports

Beyond services, AT&T recently announced that it would port three AT&T software systems to NT by the end of 1995: its transaction processor (Top End); a high-availability and clustering system (LifeKeeper); and network back-

AT&T GIS, *page 52*

No Matter How Attractive They Mean Nothing



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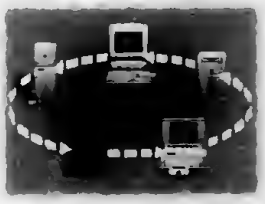

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Briefs

NetWare group renamed

The Certified NetWare Engineer Professional Association in Provo, Utah, recently changed its name to the Network Professional Association (NPA). While the association initially served Novell, Inc.-oriented Certified NetWare Engineers, both its membership and its sponsorship are now multivendor in nature. NPA members are professionals who design, implement or maintain computer networks. The NPA is reviewing the professional certification programs of several additional vendor sponsors, including Banyan Systems, Inc., IBM and Lotus Development Corp.

Wyse to venture into China

Wyse Technology, Inc. announced last week that it had reached an agreement with China to provide Intel Corp.-based systems to China's Hospital Administration Institute. The symmetrical multiprocessing (SMP) servers will run SunSoft, Inc.'s Solaris operating system and Illustra Information Technologies, Inc.'s object-oriented database. Wyse formed a joint venture with the Beijing-based hospital agency, which manages some 200,000 hospitals throughout China. However, individual hospitals will make their own decision about using the new system. Wyse also announced it has partnered with The Santa Cruz Operation and IBM to preinstall Notes on SMP servers running SCO Unix or OS/2. Wyse said it will ship the OS/2 bundle at the end of the month and the SCO bundle after Lotus delivers SCO Unix in October.

Mail update due

Microsoft Corp. said it will deliver Mail Version 3.2A, an update that contains a bundle of fixes for specific problems and an administrative utility for purging mailboxes, next month.

Workflow integration

Work is flowing everywhere. Reach Software Corp. made a bevy of partnership announcemeots about integrating Reach WorkMan, a workflow routing engine, into various producta. Reach will partner with SoftSolutions Technology Corp. and PC Docs, Inc. for workflow-enabling document management and with Hewlett-Packard Co. to build WorkMan into HP's messaging line.

AT&T GIS

CONTINUED FROM PAGE 49

up and restore software (NetVault and CommVault). It will also provide network and systems management software for NT. The company also plans to improve interoperability between Unix and NT servers with Advanced Server for Unix.

AT&T hopes its moves present it as a full-service NT supplier and give it an edge over traditiooal PC companies.

"I'm not sure a Fortune 500 company is going to bring in Compaq as an enterprise systems supplier," said Michael Goulde, a senior consultant at the Patricia Seybold Group in Boston.

Added value?

However, one user was unimpressed. "I doo't trust that the larger systems vendors necessarily add the value they say they add, nor that we need the valne they think they add," said David Greenberg, director of new systems development at Orlando Health Care in Florida. "Bring the AT&T GIS guy in, and your budget doubles."

Greenberg said he would oot look to the hardware vendor to supply integration and services. "We would do it ourselves," he said. "My big integratioo problem is getting my applications to work properly oo the operating system and hardware. But I don't oeed much from Compaq in that regard or from Microsoft."

Peter Kastner, an analyst at Aberdeen Group in Boston, agreed. "AT&T needs to look over their shoulder at Compaq, which is showing all the signs of being able to compete in the one- to eight-processor space," he said.

Higher scalability

A booo for both AT&T and Compaq Computer Corp. is that their servers are based on Intel Corp. microprocessors rather than RISC. "I would be hard-pressed to see more than 10% to 15% [of NT] oo platforms other than Intel," Card said.

Unlike Compaq, AT&T's line scales up to 16 processors. But for some, that is a drawback. "The software guys build software that permits scalability with smaller rather than bigger boxes," Goldberg said.

According to Carlson, the average price for NT servers sold jumped to $49,000, from $14,000 last year, or from a two-processor to a four- or eight-processor box.

But he acknowledged that NT will always be popular on low-end machines. That is why the company plans to push more toward high-volume indirect channel sales.

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Paul Gillin

Groupware goodies

Although tiny by trade show standards (6,000 attendees), GroupWare '94 in San Jose, Calif., early this month featured more raw innovation than any show I've seen in a long time. With the software industry's major players spending a lot of time sniping at one another over APIs and pricing, the largely no-name group of vendors at GroupWare has been busy generating some remarkable ideas for people to work together more effectively.

Here, in no particular order and by no particular selection criteria, are some of the show's highlights:

• **ForeFront Group, Inc.**'s Virtual Notebook System (VNS) is a feat of software engineering wrapped around a user interface that is truly different. Imagine a whiteboard shared by several people, with everyone scrawling their ideas and comments on its surface. The comments can include graphics, drawings, bit-mapped images, spreadsheets, hyperlinks to other whiteboards or anything else you can embed in a Windows icon.

Now imagine that you can take that board full of comments and look at them selectively. For example, you can isolate the information added by Jane down the hall on Monday or Russell in Scotland last night.

The real engineering stunt in VNS comes when multiple users work simultaneously on the same notebook. Houston-based ForeFront demonstrated a Macintosh, Windows and Motif system connected to the same server and working on the same document. Each change a user makes is instantly reflected on the screens of all the other users on the network in its native format. Very neat.

The downside of VNS is that it requires a $6,000 Unix server component and all the administration that goes along with it. This would be a great peer-to-peer product for small workgroups, a possibility that ForeFront executives said they are considering. You also wouldn't want too many people to share one notebook because the result could be sheer chaos.

• Also building on the whiteboard metaphor is **Corporate Memory Systems, Inc.** in Austin, Texas, whose CM/t groupware is essentially a giant whiteboard on a PC. Have you ever been in one of those meetings where flipchart pages get torn off and taped all over the room? CM/t uses that image to build a three-dimensional visual discussion tree.

CM/1 is a spin-off of research done at the Microelectronics and Computer Consortium on group decision-making. A user starts with a question or an idea, which is represented as an icon on the whiteboard. Other users chime in with their own thoughts and link them with lines and arrows to other threads of the discussion. Subtopics can be developed and spun off, like threaded discussions on a bulletin board. However, the whole thing can be sliced and collapsed in a number of ways. Like ForeFront's VNS, CM/t lets users embed Windows objects into the discussion and provides auditing and security.

CM/t is a terrific way to capture the brainstorms that come up during meetings but so easily get lost when transcribing notes. Like a lot of good groupware, CM/t doesn't replace meetings but makes them more productive. The product sells for $495 per client.

• Speaking of productive meetings, C. A. Facilitator from a small, Santa Barbara, Calif.-based consultancy called **McCall, Szerdy & Associates** brings a new dimension to that process. Facilitator builds on the concept of an electronically enabled meeting, during which participants sit around a conference table with their own computers and contribute ideas anonymously.

Where Facilitator is different from other products is in its use of an underlying relational database — Acius, Inc.'s 4th Dimension. The groupware product provides clever features for categorizing discussion comments, voting on questions and analyzing the characteristics of those votes. What's most interesting is C. A. Facilitator's ability to store comments and action items in a database and manipulate them. Like a lot of good groupware, the product helps capture the 95% of a meeting that is lost because no one writes it down.

However, priced at $5,000 for five users, C. A. Facilitator is very expensive. It's also a Macintosh-only product. McCall, Szerdy says it's addressing issues through a forthcoming Windows port and promotional pricing that will likely become permanent. The firm also has only five customer sites at this point.

By the way, each of the above products has its own internal E-mail system. Message fatigue is becoming the corporate disease of the '90s.

Gillin is *Computerworld*'s editor. He can be reached on the Internet at pgillin@cw.com.

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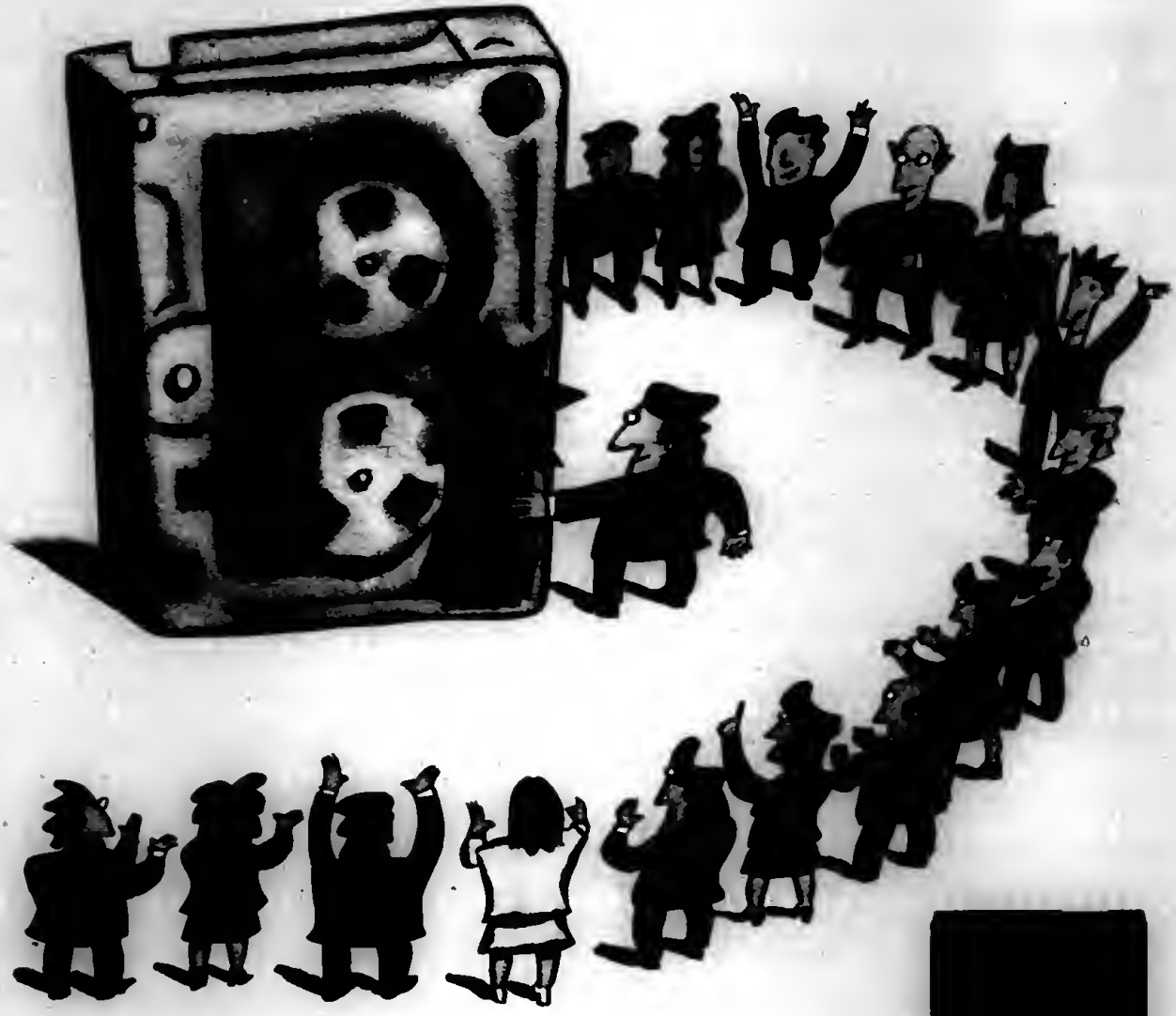

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Software distribution

OnDemand tool eases upgrades

By Elisabeth Horwitt

A recent upgrade to OnDemand Software, Inc.'s WinInstall product line provides what some LAN administrators describe as an effective way to eliminate the grunt work from PC software distribution.

"I think this is the final answer to software distribution," said Michael Garrett, a network administrator at Mellon Bank, Inc. in Pittsburgh. "There is no way I could have gone from [supporting] 30 users to supporting 140 users in the last year without this. I would have needed 10 people, not two, working for me, and [the software upgrade process] would still be wrong."

With the software, Garrett said he can install PC applications in 30 minutes in most cases. Before, he said, "imagine carrying disks from computer to computer and running the install on each desktop."

"Ever since Windows came out, I've been struggling — all LAN administrators have — to distribute applications to each client," agreed Joey Cartwright, a technical adviser at Federal Express Corp. in Memphis. "We have 300 clients, and if you had to walk to each PC to install or upgrade an application, that's all you'd ever do." Furthermore, "when you load a PC application, you never know what has been changed" in the .INI files and the subsystem directories.

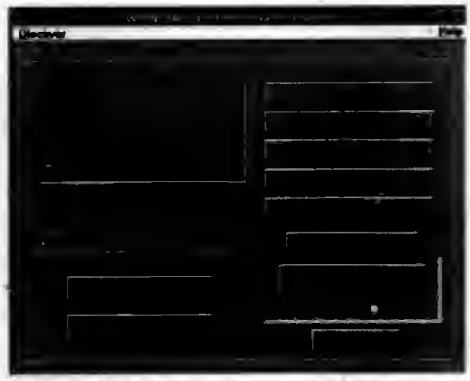
What differentiates WinInstall

OnDemand, *page 58*

What's new

WinInstall upgrades still in the works include the following:

- A WinInstall remote client that will make software upgrades available automatically to remote nodes, such as traveling laptops, that attach to LANs only occasionally, said Jack Palmer, OnDemand's manager of sales and technical support.
- Automatic compression, install and uninstall routines will be deliverable over dial-up modem lines, he added. The feature will be available with the next version, due out this fall.
- A utility that will export entire applications, including .DAT and .REG files and all other files required for installations, from one file server to another, the firm said.
- The ability to schedule installations.
- Integration with popular database formats, including Borland's Paradox and Microsoft's SQL Server.



The Discover feature *in OnDemand's WinInstall takes snapshots of a PC's configuration before and after an upgrade*

Guarding the Internet

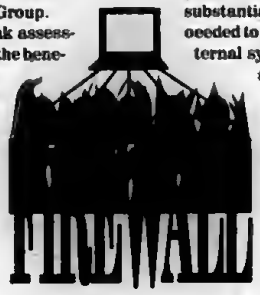
Users identify security risks and debate potential solutions

By Gary H. Anthes

■ Users generally agree that Internet access brings security risks from viruses and hackers, but few agree on the extent of the risk or what to do about it.

"The Internet provides no security, no assumption of privacy, no expectation of integrity and no assumption of authentication," said Michael P. Ressler, a member of Bellcore's Secure Communications & Services Group.

Despite that bleak assessment, Ressler said the benefits of an Internet connection outweigh its risks. "E-mail alone would lead you to connect," he said.



Connecting to the Internet is inevitable for most companies, according to Ressler. "You might as well face it: Your employees will connect to the Internet," he said. "You cannot enforce a prohibition against modems."

Ressler said it is easier to establish usage policies before employees connect to the Internet than it is afterward. "The sooner you provide controlled access, the less likely you are to have uncontrolled access," he said.

Ed Hepker, administrator of information security at USA Group, Inc. in Indianapolis, said the company is connecting to the Internet for electronic mail but had not yet decided to go further — to allow file transfers, for example. But he said, "Even E-mail is risky."

Hepker said the apparent diversity in how companies view Internet risk may stem from economic considerations, with only large organizations able to make the substantial investments needed to safeguard their internal systems from intrusion.

For many companies, the primary investment is for a "firewall," a router or dedicated computer that sits between the Internet and internal networks, with software that enforces security policy. The most restrictive firewalls allow only E-mail to go into and out of the company; file transfers and remote log-ons are blocked.

Data network pioneer Leonard Kleinrock, chairman of the Computer Science Department at the University of California at Los Angeles, said a firewall that passes only E-mail is "reasonably safe." He advised companies not to connect to the Internet for other purposes until fundamental improvements in network architecture have been made (see story below).

"Firewalls are a knee-jerk reaction, a quick fix," said Kenneth J. Cutler, a vice president at the Information Security Institute in Framingham, Mass. He said Internet Protocol "packet filters" in firewalls may be too restrictive, inconveniencing users and slowing performance. Also, router tables and filters may be very complex and, if set up incorrectly, may offer a false sense of security, he added.

Ressler agreed, saying that the people who set up firewalls are often networking experts but not security experts. "They may know what activities they have prevented but not what activities they have not prevented," he said. In addition, firewalls tend to leave weak audit trails, he said.

Despite security threats, some firms have decided to take a permissive approach. "We have people putting Mosaic on workstations and downloading gigabytes of data from Russia and everywhere else," said Wendall A. Reimer, information systems and data processing security supervisor at 3M Co. "But we have decided the benefit is greater than the risk."

Taking the security initiative

Leonard Kleinrock led the effort to develop the Arpanet, the forerunner of today's Internet, in the late 1960s. Now Kleinrock says the Internet may require a major overhaul. "We may find that radical new architectures are required in the Internet for security," he said. "The problem is not solved yet."

Kleinrock said what is now needed most is basic research, not vendor solutions. "We need an architecture for security, not just add-ons," he said. "Add-ons just won't hack it."

But vendors are not waiting for new architectures. Three weeks ago, tiny NetMarket Co. in Nashua, N.H., became the first company to offer an encrypted credit-card transaction service over the Internet. Using a public-key encryption technology called Pretty Good Privacy, a man in Philadelphia sent his encrypted credit-card number to a virtual "storefront" on NetMarket's computer and purchased a compact audiodisc. —*Gary H. Anthes.*

Leonard Kleinrock *and the first Arpanet switch, installed in 1969*

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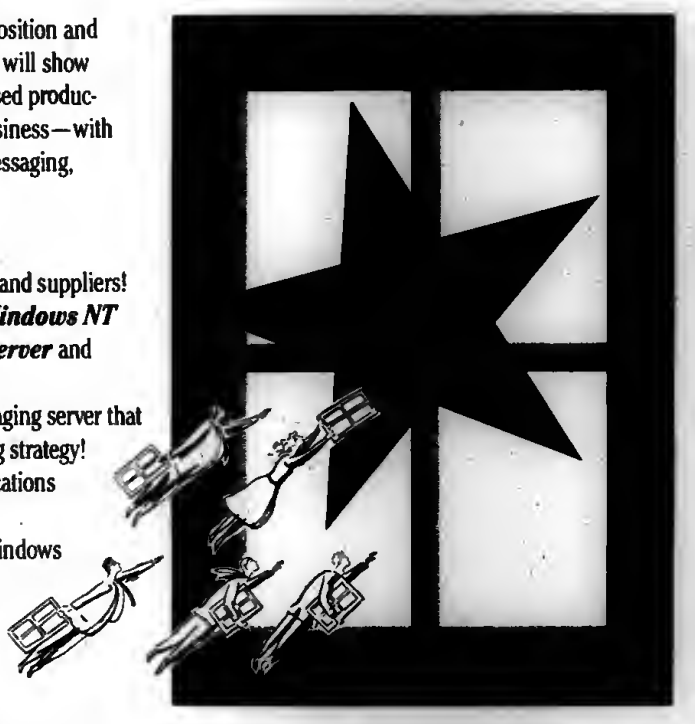

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8ARIA

Asynchronous Transfer Mode

Switching market to explode at Interop

By Stephen P. Klett Jr.

■ Next month's Networld/Interop '94 show is shaping up to be the battle of the Ethernet-to-ATM switching start-ups.

Newcomers NiceCom, Inc., Zylan, Inc. and Agile Networks, Inc. each will display a line of switching hubs designed to migrate users' existing LANs to Asynchronous Transfer Mode (ATM).

According to analysts, these companies are hitching themselves to the switching bandwagon at the right time.

"There's clearly a lot of demand for switching products for applications such as to upgrade backbones and for server access," said Kathryn Korostoff, president of Sage Network Research, Inc. in Natick, Mass. "People are definitely hitting a bandwidth wall and are looking at switching — with an eye on ATM — as a solution."

New on the block

Zylan, a start-up formed by former Fibermux Corp. employees, will unveil a family of LAN switches with ATM and Fiber Distributed Data Interface (FDDI) connections at Networld/Interop, according to sources briefed by the company.

Zylan will display a low-end workgroup Ethernet switch with 12 ports called PizzaSwitch for $6,650 and a five- and nine-slot hub called OmniSwitch, which will start at $3,500. A variety of modules will be available for the hub including Ethernet, FDDI, Token Ring and ATM, the sources said. PizzaSwitch will ship in the first quarter of next year, and OmniSwitch will be available in the fourth quarter of this year.

NiceCom, a subsidiary of NiceCom Ltd. in Lexington, Mass., will show a family of Ethernet-to-ATM switches. Called NiCell, the family is based on an application-specific integrated circuit called ZipChipt, which converts data packets for Ethernet-to-Ethernet communication directly into 53-byte cells — the standard length of an ATM cell.

According to NiceCom officials, converting packets to ATM cells on one chip inside the switch will provide a smoother path to ATM by enabling cell-switched Ethernet segments to be attached to ATM switches via built-in interfaces once standards are set — without having to swap out existing hardware.

The NiCell family is composed of the following three switches:

- **NiCell 200:** Workgroup switch with 12 Ethernet ports and one ATM port. Price: $8,400.
- **NiCell 1200:** Departmental switch with 48 Ethernet ports and four ATM ports. Price: $48,100.
- **NiCell 2000:** Backbone switch with 16 ATM ports. Price: $36,900. Dual-power supplies, processors and hot-swappable modules and fans are available as options.

The switches will be available in January.

Los Angeles-based Agile Networks, meanwhile, will show two ATM switching products called ATMizer and ATMman. Details were not available at press time.

Market uptick

Sales of Ethernet switching hubs stood at $99.7 million for the first half of the year and were up 30% in the second quarter, according to market research firm Dataquest, Inc. in San Jose, Calif.

Tried and true

Users were upbeat about the attention being paid to switching, but some were reluctant to buck their traditional vendors such as SynOptics Communications, Inc. and Cisco Systems, Inc. and place their networks in the hands of a start-up company.

"These products sound appealing, but we'll probably wait for Cisco to come out with a similar product. Going with Release 1.0 of anything is just too risky," said Jon Castle, a message engineer at Commonwealth Edison in Chicago.

According to Korostoff, overcoming this attitude will be NiceCom's — and any start-up's — greatest challenge. "However, start-ups do have one advantage," she said. "They are starting fresh and are not dragging any baggage behind them and don't have to worry about protecting the investment of their installed customer base."

LAN, SNA vendors team

Data Switch/Lannet accord brings new products to market

By Suruchi Mohan

Users who want to join the LAN and SNA worlds will soon get some more options from Data Switch Corp. and Lannet, Inc. Those companies recently announced they will jointly develop and sell products.

The accord will also open up each vendor's traditional market. "Data Switch gets entre into the LAN world and Lannet into the SNA world," said Melinda Le Baron, a research director at Gartner Group, Inc. in Santa Clara, Calif.

Data Switch in Shelton, Conn., focuses on data center products, including those for SNA. It will seek to make inroads into the LAN workplace by supporting Lannet's intelligent hubs. For its part, Lannet in Irvine, Calif., will seek a toehold in the SNA world by providing connectivity between SNA and LAN traffic through its intelligent hubs.

Source: Infonetics Research, Inc., San Jose, Calif.

Module mania

Lannet has announced the availability of four modules that plug into its MultiNet intelligent hubs, allowing managers in companies with large legacy systems to integrate mainframes and LANs as they move toward a client/server architecture. Lannet has also announced MultiMan/6000, a graphical network management application for managing MultiNet hubs from IBM's NetView/6000 network management platform.

Although providing connectivity between legacy and LAN worlds is not a new phenomenon, "the fact that they are using a hub is different," Le Baron said.

The modules are as follows:

- **Integrated SDLC to Token Ring Converter.** This allows administrators to attach cluster controllers to an Synchronous Data Link Control (SDLC) or Token Ring port on the hub instead of the SDLC port on the front-end processor (FEP). Administrators can thus get rid of the SDLC link between the cluster controller and the front-end processor because the SDLC traffic now goes over the LAN.
- **Token Ring Extension Bridge.** This module, which supports multiple protocols, connects remote Token Ring sites to a central site without a multiprotocol router.
- **Integrated FEP to Token Ring Converter.** This allows a front-end processor not equipped with a Token Ring port to connect to Token Ring via the hub. It converts SNA traffic into Token Ring traffic inside the hub.
- **Integrated FEP to Token Ring Converter/Gateway module.** This lets SNA managers view Simple Network Management Protocol (SNMP) traps generated by LAN hubs. It also converts SNMP traps into host NetView alarms.
- **MultiMan/6000.** This allows network managers to diagnose and control all MultiNet hub devices on their network.

The products are available now. Each product is priced separately.

[redacted]

Wandel & Goltermann, Inc. has announced the Internetworking Delay and Reachability application. According to the Morrisville, N.C., company, the application measures end-to-end network delays between pairs of segments.

The product is an option with Wandel & Goltermann's IDMS-3000 Series Manager for Remote Network Monitoring probes. A set of IDMS-301x probes periodically communicate with one another to compile a profile of round-trip delays. Alarms can be set to go off in the case of a disconnection or if the delay exceeds a user-defined threshold.

The Internetworking Delay and Reachability application costs $2,500.

▶ *Wandel & Goltermann*
(910) 460-3300

Accton Technology Corp. has announced the EtherHub-8S and the EtherHub-16S, LAN hubs.

According to the San Jose, Calif., company, the hubs provide plug-and-play integration with no DIP switches or settings, come with a metal casing and include a microprocessor that controls a LED array for network monitoring at a glance.

The EtherHub-8S is an eight-port hub designed to add 10Base-T ports to a 10Base2 or 10Base-T network. The EtherHub-16S is a 16-port hub with auto-jabber control, auto-reconnect, wiring fault detection and polarity correction. The LED display indicates CPU activity, connection status, partitions, collision rates and twisted-pair connections.

The EtherHub-8S costs $299, and the EtherHub-16S costs $599.

▶ *Accton Technology*
(408) 452-8900

Product short

SQN, Inc. has announced Autofeed II, an automated signature capture system, and Signer Confidence, a signature recognition system. Autofeed II lets banks and processing houses eliminate hand scanning, manual cropping and manual account number entry by automatically capturing the signature in an electronic file. Signer Confidence inspects checks automatically, makes pay/no pay determinations and batches questionable transactions on-screen for operator approval. Cost: Autofeed II starts at $5,000; Signature Confidence starts at $12,500. SQN, Rancocas, N.J. (609) 261-5500.

OnDemand

CONTINUED FROM PAGE 55

4.0 from other software asset management and installation packages is its Discover feature, Garrett and Cartwright said. This takes snapshots of a PC's configuration before and after a software upgrade. The software tracks changes to .INI and to a registry for Microsoft Corp.'s Object Linking and Embedding.

This registry contains "every relationship between Windows applications," particularly suite applications that share Dynamic Link Libraries, said Jack Palmer, manager of sales and technical support at Naples, Fla.-based OnDemand. For example, "you might have an icon embedded in Excel" to call Microsoft's Mail or a link to an Excel spreadsheet embedded in a word processing document.

Conversely, Discover enables the LAN administrator to remove an application or an upgrade "without disrupting other applications or features," Garrett said. "It removes the files [associated with an upgrade] and also pesky little lines in WIN.INI and SYS.INI files you'd have to be a micro surgeon to dig out."

Garrett said this is particularly useful when "I'm installing a package, and for some reason it is conflicting with something else. I can try removing this or that, down to base unit, to see what is conflicting."

The "after" snapshot file is used as the installation file for the new software, which users can then access by calling up the WinInstall icon on their PC.

The process is particularly useful when a LAN administrator wants to make a number of upgrades or packages available to a group of users on an optional basis.

High-use management

Software asset management software from companies such as Boston-based Frye Computer Systems, Inc. and McAfee Associates, Inc. in Santa Clara, Calif., can track configurations and software and hardware assets on PCs and distribute new software releases and updates on the basis of those configurations [CW, Aug. 15].

This is particularly useful for companies whose users have a broad range of configurations on their desktops, in terms of type of CPU, main memory limitations, configuration files and version numbers of applications.

However, WinInstall 4.0 cannot track differences of individual PCs. And while the above products support virtually all of the leading PC operating systems, the OnDemand package supports only Windows for the time being. Eventually, OnDemand plans to support Chicago, the upcoming version of Windows.

As a result, WinInstall 4.0 is most useful to firms that keep fairly uniform configurations across their PC installations.

User affirmation

However, for firms such as Fedex and Mellon Bank, WinInstall is the right choice. "[McAfee's] Brightworks does PC inventory gathering well, which WinInstall doesn't do," Cartwright said. "But Brightworks makes application distribution complicated with a lot of script writing. It's unbelievable how many mistakes you can make" if a LAN administrator or user has to manually set up configuration files for the update, he added.

WinInstall can also distribute software upgrades to users as electronic messaging attachments. And for LAN administrators who want to install software on PCs without depending on user cooperation, there is a program to incorporate updates into the Windows start-up group. When the computer boots up, the system will automatically load the new software, Palmer said.

WinInstall is priced at $495 per server, for unlimited users.

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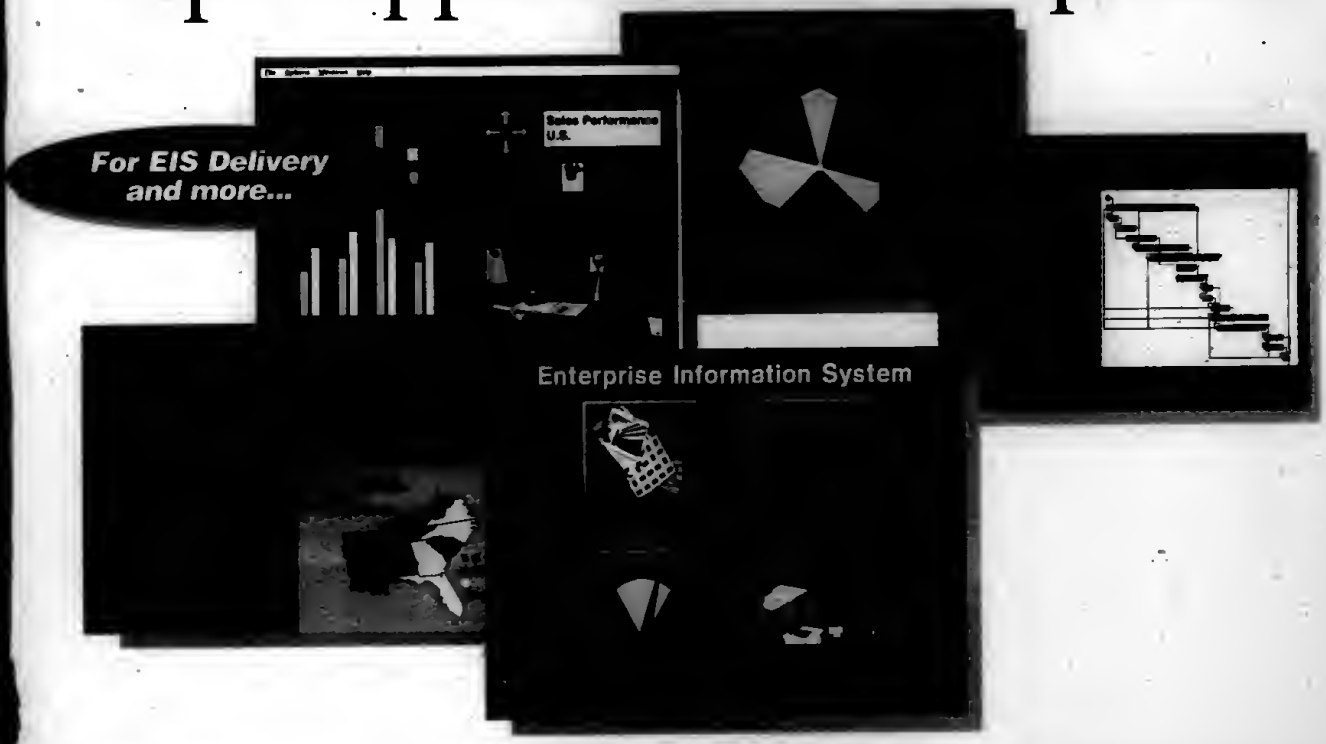

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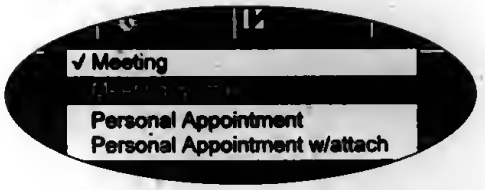

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DASD vendors battle for customers

Amdahl and HDS face new competition from EMC and StorageTek

By Craig Stedman

■ Three years ago, it was a cinch to name the mainframe disk storage vendors that routinely made customer evaluation lists along with IBM: Hitachi Data Systems Corp. and Amdahl Corp. But times have changed, and HDS and Amdahl can no longer be assured of making the cut.

The emergence of EMC Corp. and this year's belated shipment of Storage Technology Corp.'s much-publicized Iceberg array have pushed HDS and Amdahl somewhat into the background — a position from which the two companies will try to escape with new product announcements during the coming months.

HDS actually has little to feel sorry about since its mainframe direct-access storage device (DASD) shipments are expected to rise 18% this year, according to International Data Corp. in Framingham, Mass. But fast-growing EMC is poised to supplant it as the No. 2 vendor behind IBM (see chart).

Competition closing in

Amdahl, meanwhile, is a distant fourth and is watching for StorageTek in its rearview mirror. Analysts and some users said EMC and StorageTek have gotten where they are by diverging from the technical path set by IBM. HDS and Amdahl to this point have not been so bold.

Now, however, the Japanese parents of HDS and Amdahl "are seeing the results of the error of slavishly letting IBM set the technology lead," said Jim Porter, president of Disk/Trend, Inc. in Mountain View, Calif. "It turned out that IBM didn't have the right formula for everything, and that left these guys dangling."

Ted Kassel, vice president of information services at Sysco Food Services/Albany, a division of Sysco Corp. in Albany, N.Y., said he chose EMC's Symmetrix arrays in an evaluation last year partly on the basis of pricing issues but also because EMC offered new technology.

"They were pretty much out in front with" arrays based on small form-factor disk drives, Kassel said. "We had HDS in, and they talked a good game, but they just had replacements for [IBM] 3390s. It didn't impress me enough at the time."

Wayne Pattison, director of data center operations at Kansas City Southern Railway Co. in Missouri, said he plans to limit a DASD evaluation this fall to IBM and StorageTek with EMC perhaps included "mostly as a courtesy." Pattison wants to buy arrays supporting redundant arrays of inexpensive disks (RAID) Level 5 or above, and StorageTek and IBM are the only vendors to introduce such devices thus far.

"StorageTek and IBM have the best products right now, and I need it right now," Pattison said. What HDS and Amdahl have done well in the past "is mimic IBM to a tee," but that approach is no longer workable, and they have yet to prove their ability to be more aggressive with technology, he added.

Ray Cosyn, director of DASD marketing at HDS in Santa Clara, Calif., agreed that the firm cannot "wait to see what IBM delivers" anymore. HDS "will not necessarily implement everything in the same manner" as IBM in the future, starting with a RAID Level 5 device due out in mid-1995, he said.

Cosyn would not comment in detail about the future RAID product but said one planned difference with IBM's recently announced Ramac subsystems will be the ability to swap disks, upgrade microcode and add cache memory without taking the system off-line.

Big iron disk farms growing

Worldwide shipments of IBM and compatible mainframe DASDs in terabytes

	1993	1994*
IBM	340	340
EMC	118	241
Hitachi Data Systems (HDS)	136	160
Amdahl	72	80
Comparex**	32	38
StorageTek	1	73
Olivetti**	4	5
TOTAL	703	937

*Projected **HDS reseller

Source: International Data Corp., Framingham, Mass.

Amdahl also promises to be more aggressive in the future. Joseph Zemke, Amdahl president and chief executive officer, said in a recent teleconference that the company plans a late-1994 or early-1995 introduction of a RAID Level 5 unit. The product, based on Encore Computer Corp. technology, will support both MVS mainframes and high-end Unix systems.

Nick Allen, an analyst at Gartner Group, Inc. in Stamford, Conn., said Amdahl "is sort of treading water and having a little bit of trouble keeping its head above water" in the DASD market. On the other hand, HDS is "doing just fine, although it's business plan is not terribly aggressive," he said.

At whose expense?

EMC's market share gains have come almost entirely out of IBM's hide rather than HDS' or Amdahl's, Allen said. HDS benefits from strong reliability ratings on its 3390-compatible 7693 arrays, while Amdahl had been dogged until recently by reliability shortcomings and poor financial results, he added.

Erik Jensen, vice president and division manager at First Security Information Technology, Inc., the systems subsidiary of First Security Corp. in Salt Lake City, is one satisfied HDS customer. First Security has been using HDS' DASD for two years and has never had a failure "that's taken us down in any way or caused us to lose data," Jensen said.

While HDS may not always be the technology leader, "we decided that it doesn't really make that much difference to us," Jensen added. "They're going to do things in an orderly fashion. They have a little different mentality, and frankly, I look at that as a positive."

Utilities automate processes with software agents

By Lynda Radosevich

Wouldn't it be nice if someone took care of the boring, repetitive parts of your job and left you free to plan, think and strategize?

For a handful of utility companies, that someone is a something: software agent technology from Edify Corp. in Santa Clara, Calif., that can answer account inquiries, turn services on and off, dispense human resources information and notify customers of important announcements.

Since June, Lone Star Gas in Dallas has been using Edify's Electronic Workforce agent technology to route incoming customer calls to appropriate divisions and tell customers how long their phone wait will be.

Also since June, Public Service Electric & Gas Co. in Newark, N.J., has been using the agents to automate employee enrollment in financial planning seminars and workshops. Several other utilities announced their intentions to use the Edify software agents, and other companies reached last week also said they have ambitious plans for the technology.

Software agents are scripts that can automate a series of electronic operations. A negative example is computer viruses, which detect opportunities, multiply and spread themselves. Useful versions are like "a macro gone berserk" — agents that can perform the repetitive tasks that humans have to do, said Bruce Guptill, a senior research analyst at Gartner Group, Inc. in Stamford, Conn.

The dark side of agent technology is that it can trigger a human vs. machine issue.

"We're at the place now where agents can replace humans working with information systems. For instance, if your job as a middle manager was to gather, sort and analyze human resources information, software can do that," Guptill said. Currently, there is no big wave of software replacing people, but there probably will be in a few years, he said.

Jobs at risk

Like robots, software agents are meant to perform mundane repetitive work, freeing humans to do more productive work, said Bruce Guptill, a senior research analyst at Gartner Group. As robots evolved, they performed multiple tasks and learned to modify their behavior. They also raised concerns about the potential to take over jobs from humans. Software agents reflect the first two stages of robotic evolution.

Keeping customers happy

The utilities said the main force behind adopting agent technology is a desire to improve customer service, a necessary move in an increasingly competitive and deregulated market.

"Customers want to do business with the utility 24 hours a day," said Gary Smith, process owner for Lone Star's customer service center. A voice-response unit with software agents already answers phone calls. This will be enhanced to provide an interface between the customer and the host, giving customers information such as the amount of a current bill or how much was paid in the past year.

However, the agents will not make value judgments or answer sophisticated inquiries. "It fa-

Automation, page 64

D&B Software increases flow of upgrades

By Rosemary Cafasso

After a slow start, Dun & Bradstreet Software is pushing ahead with a steady stream of upgrades for its SmartStream financial software with the hope of sustaining momentum for its client/server offering.

Having shipped Financial Stream Version 2.0 earlier this month, D&B Software is now shooting to get Version 3.0 out the door by November.

The company has 55 Financial Stream customers, up from 30 in May. Financial Stream first shipped last October, and the customer base is a mix of users who are in various stages of implementation.

Analysts said the current total is a good showing but not overly impressive.

"It's not a bad number for the first year, but it's probably not where they should be right now," said Claire Gillan, director of applications research at International Data Corp. in Framingham, Mass. "They do have the largest installed [mainframe] base of software in the financial area, [so] they should really be ramping up."

To some customers, the vendor is doing just that. "A year ago, I wasn't really a fan of D&B," said Brian Behmer, an accounting manager at Reliance Electric Co. in Cleveland. "At that point, they weren't making deadlines. They came late to market, but it's amazing what they've done."

> Some users say D&B Software is making steady progress with each release of Financial Stream.

Reliance Electric is installing Financial Stream Version 2.0 and plans to upgrade to Version 3.0 when it is available.

More features

According to Behmer and other users, D&B Software is making steady progress with each release of Financial Stream. The company followed Version 1.0 with a February shipment of an accounts receivable module. Version 2.0, which was officially announced earlier this month, included new data analysis functions as well as additional payment mechanisms, both of which are key for companies that do business in different countries.

Version 3.0 is expected to include various functional upgrades. For example, it will offer a data allocation capability for the general ledger piece of Financial Stream and an accounts payable batch-load facility, Behmer said.

Bob Culmer, director of information technology at Phillips Cables Ltd. in Toronto, also said he is pleased with the delivery pace of Financial Stream functions.

"I've been in development for 15 years and I know what can go wrong in a new systems," Culmer said. "This has been a positive experience."

Ed Black, an analyst at Aberdeen Group in Boston, said he believes D&B Software is "still challenged in their installed base" when it comes to selling the concept of a client/server migration.

"I think it's good growth," Black said of the Financial Stream sales, but it's not SAP or Oracle growth."

New Sybase products on the horizon

Sybase's new SQL products

Product	Availability	Price*
SQL Server Manager	Q4	$375 to $13,750
SQL Server Monitor	Early 1995	$4,460 to $10,520
[illegible]	Early 1995	[illegible]

*Per managed SQL Server

As expected, Sybase, Inc. last week announced its new Enterprise SQL Server Manager along with enhanced versions of SQL Server Manager and SQL Server Monitor, its departmental products. The Enterprise SQL Server Manager is based on Tivoli Systems, Inc.'s Tivoli Management Environment technology. All of the products support database configuration, operational control and monitoring.

Automation

CONTINUED FROM PAGE 63

creases the efficiency of the group because the humans can be saved for the more complex questions," Smith said.

Lone Star has no plans to layoff employees due to the agent technology, but it will increase services without adding personnel, he added.

Lone Star services 1.3 million customers. It operates two Edify servers in its Dallas and Waco, Texas, customer service centers running on Hewlett-Packard Co.'s hardware and IBM's OS/2 operating system. The agents are connected to Token Ring LANs and, via a Cisco Systems, Inc. router, to a wide-area network and an Amdahl Corp. mainframe.

The project cost roughly $200,000, including servers, agent software, installation, training and some modifications to the LAN and call distribution system, according to Mart Nelson, an engineering partner at Blythe-Nelson, a Dallas-based consulting company that helped Lone Star with the project.

Return on investment

Lone Star should see a payback within four to six months. This is largely due to more efficient handling of calls, which should lead to reduced charges for its toll-free phone line, Nelson said.

Based on estimates from other utility companies, Lone Star believes roughly 20% of its callers want routine information that the automated system can handle, Nelson said.

By early 1995, Lone Star plans to launch other agents that will be able to call gas monitoring stations, check gas pressures and call operators if the readings are abnormal, Smith said.

For its part, Public Service Electric is using Edify Electronic Workforce to automate human resources functions. The company's 12,000 employees can dial into the Edify system to enroll in courses and receive confirmations from the software agent over the phone. The system will be expanded in October to allow employees to choose medical benefits during the open enrollment period, according to Nancy Cronce, project manager.

The utility runs an Oracle Corp. database on a SCO Unix server from The Santa Cruz Operation as a warehouse for employee information collected from an IBM 3090 mainframe and other sources. One Edify server, connected to a TCP/IP network, contains the agent scripts.

While Cronce was unable to estimate the project's cost and the return on investment, she said the system handles 5,000 calls per month and has the capacity to handle 12,000.

Overall, many companies are working on agent technology, but Edify appears to be ahead in its offerings, Guptill said. For instance, HP "has done some good work" but has not come out with a commercial product. General Magic, Inc.'s Telescript will be competitive in a year or two, but delivery of the Telescript technology already has been delayed until the end of the year, Guptill said.

Computer Security Consultants, Inc. has announced SecurityPac for the IBM AS/400.

According to the Ridgefield, Conn., company, SecurityPac is PC-based software that provides automated risk analysis of security for AS/400 computers.

The product provides an automated questionnaire about AS/400 security issues for the security manager to review. Then it makes recommendations for improvement based on the manager's responses.

SecurityPac costs $895.

▶ *Computer Security Consultants (203) 431-8720*

Millennium Systems Products, Inc. has announced Safe/400, system security software for the IBM AS/400.

According to the Naples, Fla., company, Safe/400 combines system security and an audit function with data control and tape management.

The product requires secondary passwords for secure applications and sensitive data. The auditing component provides inquiries and reports on systems events.

The backup/restore component provides tape and backup management, automatic tape recycling and a job scheduler.

Prices range from $200 to $28,000.

▶ *Millennium Systems Products (813) 263-9310*

Andersen Consulting has announced Mac-Pac Open 9.0, manufacturing, distribution and financial software for mixed-node manufacturers.

According to the Chicago firm, Mac-Pac Open provides more entry options, improved visibility of orders on the shop floor and product delivery flexibility to companies with high-volume sales orders.

New modules include Sales Force Automation, which enables users to enter both standard and custom product orders from remote locations, and Repetitive Supply, which is designed to handle frequent deliveries from vendors.

Users can vary product delivery to multiple locations, view pending order shipments and prepare requests for made-to-order items directly from suppliers.

Prices start at $150,000, depending on hardware configuration and number of users.

▶ *Andersen Consulting (312) 372-7100*

Legent Corp. has announced Astex Migration Manager, data-migration and recall software.

According to the Herndon, Va., company, Astex Migration Manager manages inactive data to maximize available MLI and MLO storage space, conserves CPU, tape and I/O resources and enhances response time.

The product tracks, detects and analyzes data access and usage patterns to determine likely dates of the next reference. It then identifies migration candidates and provides automated evaluation reports.

To make data available for recall, Astex Migration Manager identifies recall candidates and schedules proactive recalls during nonpeak hours.

Prices start at $11,900.

▶ *Legent (703) 708-3000*

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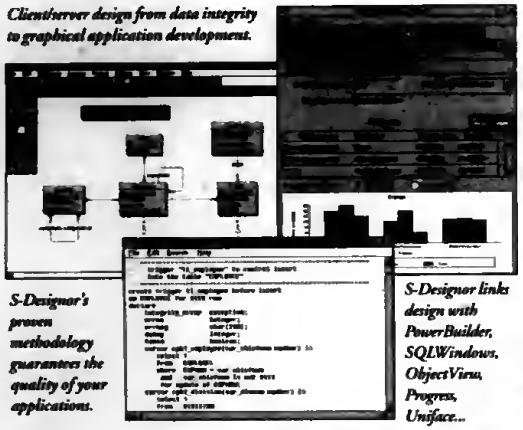

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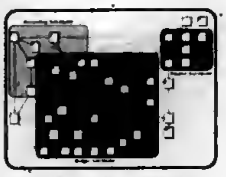

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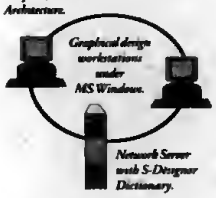

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TI interfaces to allow product interplay

Open Initiative will allow IEF to work with other vendors' tools

By Melinda-Carol Ballou

Corporations will be able to use Texas Instruments, Inc.'s Information Engineering Facility (IEF) as a repository for the mixed heterogeneous environments that make up client/server architectures, once the company releases technology that allows IEF to interplay with other vendors' tools.

Some analysts, however, said that while the move is a critical one for retaining TI's customer base, it will do little to attract new developers. Instead, customers are likely to wait and see what evolves from a Microsoft Corp./TI initiative to produce an open repository in the next 18 months or so.

NASDAQ's Lyn Kelly: *IEF's repository allows developers to have a centralized location where information can be shared across projects*

Opening up IEF

Under the heading of a project called the Open Initiative, TI officials announced that application programming interfaces (API) to the IEF computer-aided software engineering (CASE) tools and repository will ship later this year (see chart). These APIs will enable developers to support non-IEF clients and servers when creating client/server applications. It has been difficult for TI customers to use other vendors' products with IEF.

"The IEF architecture today is a very closed architecture, and you have to use their client," said Lyn Kelly, director of information engineering support at NASDAQ Stock Market, Inc. in Rockville, Md. "That won't work in an environment where you have other clients built and deployed for other tools and platforms. These interfaces are very important for us because we need to connect to a lot of third-party systems."

Larry Foster, supervisor of CASE product support at Mobile Oil Corp. in Fairfax, Va., said much of Mobile's "on-line transaction processing applications are on IEF, and our client/server development so far is for reporting and decision-support applications. It will be nice to be able to couple the two together."

TI's API specification for messaging — in early release use at NASDAQ — allows developers to write a translation service that sits on the server in front of IEF. The API hands messages to IEF in the format expected by IEF and acts as a bridge to non-IEF clients and servers, Kelly said.

At the moment, NASDAQ is managing 13 projects using IEF, the largest of which is a core client/server business application that will ultimately target 40,000 users. This key entitlement system protects trading transactions, providing security and preventing eavesdropping between brokers, Kelly said.

Developer's model

IEF's repository provides the modeling for these NASDAQ applications and allows developers to have a centralized repository where information can be shared across projects, Kelly said. This is a critical capability for creating distributed, enterprisewide client/server applications, she added.

"The IEF tool set lets you see the impact of changes across applications and plan migration across different phases of the development process, which is not something you get with an individual project tool," Kelly said.

Both Kelly and Foster look forward to work proceeding at Microsoft and TI to produce a standard industrywide repository.

While industry analysts said that opening up IEF with the new APIs is critical for TI, they were more cautious in their assessments about the Microsoft/TI partnership.

"I see a 70% probability of the two companies coming out with a product but only a 30% [chance] of it becoming an industry standard. They have to capture the imagination and become an ad hoc standard before other products evolve," said Jim Sinur, an analyst at Gartner Group, Inc., a Stamford, Conn.-based consulting firm.

A little competition

Industry sources said initiatives at IBM — including its Atlas repository for integrating IBM tools — and products due out from Seer, Inc. later this fall may provide challenges to the Microsoft/TI alliance.

Other analysts said that while the new APIs and Open Initiative are critical for enabling TI to hold on to its customers, new developers are likely to wait.

"It's a good move on their part, though it's long overdue," said Peggy Ledvina, an analyst at Meta Group, Inc., a consulting firm in Reston, Va. "New users are not likely to be attracted until the new object-based repository ships" from TI and Microsoft.

Playing well with others

Texas Instruments is allowing its IEF family of development tools to work more closely with other vendors' wares. Toward that end, it will do the following by year's end:

- Publish physical encyclopedia structure
- Document logical structure
- Define encyclopedia APIs
  - —Extend capabilities of public interface
  - —Provide a more real-time mode of operation
- Complete first draft of document on message format for client/server applications

TOOLS

Mitch Betts

Say no to bad queries

Some people say there is no such thing as a stupid question, but there is such a thing as a bad query. End users and even computer programmers can dash off a SQL query to the relational database that fails to "join" the proper tables, for example, and get a dangerously wrong answer.

The scary thing is it may not be apparent that the answer is wrong. At this very moment, someone in corporate America is probably looking at a financial report generated by a faulty query. Let's just hope they're not making any bet-the-business decisions.

A study by John B. Smelcer of American University in Washington found that users omit the join clause because they never learned it, they forgot to use it, there was no clue they needed one or they mistakenly reused a single-table query.

"The power of SQL is that you can take a set of tables and do arbitrary joins on them. I guess that's also its downfall, too, because you can come up with results that are incorrect," confirmed Merrill Holt, vice chairman of the SQL Access Group, an industry consortium.

Consequently, the headlines about new products called SQL-this and SQL-that — and even plans to use SQL for text retrieval — give folks in the human factors field the heebie-jeebies.

The reason end users are writing SQL queries at all is that IS departments are swamped, and users want fast direct access to the data.

Then, the first generation of query and reporting tools came out and alleviated the need for end users to know SQL. These tools are still not foolproof, however, because the user is still exposed to the database structure and needs to know how terms like "sales revenue" are defined.

Lo and behold, IS departments are inundated with requests by users to verify that their little SQL program is correct. So IS involvement hasn't really diminished; it just moved to a different part of the cycle.

Avoiding complexities

Now a second generation of tools is on the market, such as BusinessObjects from Business Objects, Inc., Impromptu from Cognos Corp. and Esperant from Software AG of North America, Inc. These products not only shield users from SQL but also from the complexities of the database.

"When we go to train a new customer, they usually ask us to recreate a report in BusinessObjects that they've been doing another way," said Perry Mizolta, vice president of marketing at Business Objects in Cupertino, Calif. "It is very frightening to see how many times the results come out different. Once we track

Betts, *page 68*

OLE applications

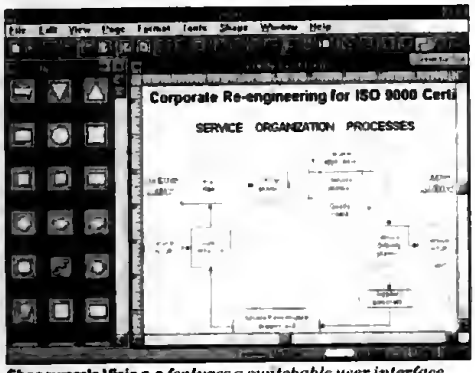
Shapeware's Visio gets an interface-lift

By Stuart J. Johnston

Shapeware Corp.'s Visio business-drawing package received a face-lift this month — literally.

Version 3.0 of the Seattle-based company's product, which was one of the first Object Linking and Embedding (OLE) "object" applications, now features a switchable user interface that can adopt the look and feel of two popular applications suites.

Users of $199 Visio 3.0 can choose to run the product's native user interface or switch it to more closely resemble either the user interface of Microsoft Corp.'s Office or Lotus Development Corp.'s SmartSuite applications suites, said Morgan Brown, Visio product manager.



Shapeware's Visio 3.0 *features a switchable user interface that can adopt the look and feel of Microsoft's Office or Lotus' SmartSuite application suites*

The ability to select the interface will let users purchase a single version of the product — no matter what applications suite they run — instead of having to buy a product tailored to either suite, Brown said.

One of OLE 2.0's features is "in-place editing," which lets users edit an information object that has been inserted into a compound document where it is, rather than having to open a separate window. An object is anything that the user links or embeds into a compound document that was created by another OLE-enabled application.

Brad McLane, president of Caladonia Systems, Inc. in Tacoma, Wash., said he likes another new feature of Visio 3.0: its SmartConnectors technology.

This feature tries to guess the user's intent when he is constructing a diagram. It will automatically draw connections between screen elements and reroute lines indicating connections if elements are moved.

McLane, a software developer, uses Visio to draw programming diagrams during the design phase of development.

"It's easier to do my design thinking work in Visio than on a notepad, which is what I did before," McLane said. "I can think through the whole design process right on the screen."

Upgrades for existing Visio users cost $69.

Software Quality Automation, Inc. has announced SQA TeamTest for PowerBuilder 3.0, a graphical user interface testing tool for Powersoft Corp.'s PowerBuilder development environment.

According to the Woburn, Mass., company, SQA TeamTest for PowerBuilder 3.0 integrates automated test execution and repository-based workflow defect tracking.

New features include a configurable PowerBuilder object recognition model, expanded object state cases, customizable rules-based workflow and a three-dimensional graphics engine for the management and measurement of test results.

The product supports test planning, development and execution along with results analysis, defect tracking and summary reporting.

SQA TeamTest for PowerBuilder costs $2,495.

▶ *Software Quality Automation (617) 932-0110*

Watcom International has announced VX-Rexx 2.1 and VX-Rexx Client/Server Edition 2.1, visual application builders for OS/2.

According to the Waterloo, Ontario, company, VX-Rexx 2.1 features customization of object properties, multithreading support, object-oriented graphical user interface runtime support, drag-and-drop programming, application integration and an interactive debugger.

VX-Rexx Client/Server Edition 2.1 incorporates database objects and lets users visually generate and test SQL queries. Charting capabilities include support for a dozen chart types with more than 150 display options.

VX-Rexx 2.1 costs $99, and VX-Rexx Client/Server Edition 2.1 costs $299.

▶ *Watcom (519) 886-3700*

Precision Digital Images Corp. has introduced the MVP Development Kit for designers of products based on Texas Instruments, Inc.'s Multimedia Video Processor.

According to the Redmond, Wash., company, the product supports image processing, two- and three-dimensional graphics generation, audio signal processing and full-motion video capture and display.

The MVP Development Kit lets designers combine industry-standard application software with their own proprietary algorithms.

The MVP Development Kit costs $8,995 for an 8M-byte RAM configuration and $9,995 for a 32M-byte RAM configuration.

▶ *Precision Digital Images (206) 882-0218*

Product shorts

Persistent Data Systems, Inc. has announced IDB Object Database for the IBM RS/6000. The product provides developers with object database technology that controls how objects are displayed. The IDB Object Database runs on a wide range of hardware and operating systems platforms, and a developer can target all platforms with a single application. Cost: $4,000 per developer license. Persistent Data Systems, Pittsburgh, Pa. (412) 963-1843. . . . **Software Pundits, Inc.** has introduced Mirage, a Windows application programming interface, and Affinity, linking and embedding technology for Unix. Mirage lets developers migrate Windows applications to the Unix platform, linking the Windows application with the Mirage runtime library to produce a Motif application. Affinity lets developers manage and control application interoperability and provides linking and embedding capabilities in a Unix environment. Cost: $7,500 each. Software Pundits, Burlington, Mass. (617) 229-6655.

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"Got our users up on new system instantly. The whole migration resulted in $1M per year savings. Got applications moved in 4 months. On target and on budget." —G.D. Searle

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Betts

CONTINUED FROM PAGE 67

down the issues, we find that the older reports had incorrect results."

With the second-generation tools, the IS department's database administrator defines a translation layer between the query tool and the underlying databases. Software AG's Esperant even uses an expert system, which monitors the user's query specifications to prevent illogical or semantically incorrect SQL statements [CW, March 14].

So what we've learned is that turning hard-core programming over to end users is not the answer for getting correct answers. Cutting the IS department out of the loop just doesn't work.

We don't want to go back to the days where the IS department did the whole job — and delivered the answers months after decision-makers needed them. But we do need some behind-the-scenes IS involvement to make sure end users get something better than garbage pumped out of the corporate information refinery.

Betts is a *Computerworld* senior editor in Washington. His MCI Mail address is 601-2483.

■ INSIDE
A *really* new CIO at Patagonia. See page 72.

CAUGHT in the MIDDLE

BY JULIA KING

A FEW COMPANIES HAVE SUCCESSFULLY ESTABLISHED IS ACCOUNT MANAGERS AS INTERMEDIARIES BETWEEN IS AND USERS. BUT IN MOST FIRMS, OFFICE POLITICS AND DISTRUST ARE STUNTING THE GROWTH OF THIS NEW POSITION.

SELLING TOP EXECUTIVES at GE Capital Rail Car Services four years ago on the idea of hiring account managers was a cinch for John Seral. All he had to do was show management how much money was being squandered on information systems project delays and cost overruns. The tab was already in the millions and still running.

But selling the same idea to users at the Barrington, Ill., firm was another matter altogether, says Seral, now vice president of information technology at GE Capital Auto Financial Services. The last thing users wanted was yet another layer of bureaucracy between them and the IS department. As it was, projects regularly ran months behind schedule and, once delivered, were often unusable.

The concept of employing IS account managers — also known as business account managers, account executives and business analysts or consultants — as intermediaries between users and IS arose about 15 years ago.

The position has been viewed as

Caught, *page 70*

Mary Shaw

IS account managers function best on high-level, mission-critical projects, says John Seral, vice president of information technology at GE Capital Auto Financial Services.

Caught

CONTINUED FROM PAGE 69

a way to help align IS with overall business goals. An account manager is part translator, part lobbyist and part consumer advocate. Business-wise and technologically savvy, they are charged with conveying users' needs to IS developers and overseeing the process of getting those requirements met on time and on budget.

Or so the theory goes.

In practice, companies have been slow to adopt the IS account manager position. One of the primary reasons is lingering skepticism about IS/user liaisons in general.

Another is that some non-IS executives see the liaison role as adding little or no value to the overall business, says Richard D. Koeller, a former chief information officer and now president of Koeller and Associates, a Chicago IS consultancy. Some non-IS executives also fear that overeager account managers will upset the power structure, he says.

In other cases, account managers have been appointed but not given the authority they need to expedite users' requests.

"In companies I've seen try to set up the position, that person turns into the guy or gal with the steno pad. They become very high-priced clerks and fail miserably," says Cheryl Currid, president of Currid & Co., an IS consulting firm in Houston. Currid speaks from experience, having previously served in an account manager-type role at Houston-based Coke Foods in the early 1980s.

Still, there are a few Cinderella stories.

One of them is San Diego County, where for the past six years 12 account specialists have served 58 departments as a one-stop shop for virtually anything to do with IS.

Most of these account specialists have extensive experience in business as well as some IS expertise. They take direction from departmental managers but report to Jon Fullinwider, director of the county's Department of information Services (DIS).

"We include our account manager in meetings where we're planning things that impact IS, and we include them in meetings with other departments," says Bob Modell, manager of the information technology division at the Department of Social Services, one of DIS' user departments.

"When the account manager is there, we know other departments and IS are going to know what's going on," Modell says.

But it wasn't always that way, according to Sandy Bernstein, budget, fiscal and chargeback manager at DIS. There were plenty of false starts along the way. One of the bigger ones occurred in changing the way departments were charged for account managers' services.

"Originally, this position was an overhead position, but in its second year, the auditor's office decided to bill out [account managers'] hours to various departments," Bernstein says.

The result was disastrous. "When departments saw the costs associated with having account managers work with them, they didn't invite them to meetings they had invited them to before. It was very detrimental to what DIS needed them to do, which was to be involved in planning up front," Bernstein says. After a few months, the billing system was changed back.

Today, users and managers say they regard the county's account managers as indispensable.

"If we were to shut this organization down, they'd be the last people I'd let go," Fullinwider says.

Speaking from a user's perspective, Modell says, "It's not that they do things that are impossible to get done. They just make it possible to get going and get moving a lot faster. The way it's set up is that account managers can cross all department lines and are able to talk to anyone."

Choosing the right person for the job is a critical ingredient to successfully implementing the account manager model, IS executives say. Ideal candidates are well-versed in the business and have a broad knowledge of information technology. Their communication skills should be absolutely top of the line. So should their ability to create consensus, broker contracts between IS and business departments and quantify the benefits of IS solutions in business terms.

At GE Capital Auto, account manager applicants even take a

MISSION-CRITICAL SKILL SET

To be effective, IS executives and consultants say, IS account managers must:

- Be knowledgeable about their company's business.
- Have a strong understanding of information systems.
- Possess outstanding communication skills.
- Be good consensus builders.
- Be thick-skinned.

At GE Capital Auto Financial Services, the salary for an IS account manager ranges from $40,000 to $110,000. The big bucks go to the account managers with the skills and experience to work on strategic, business-changing projects.

Source: John Serat, vice president of information technology, GE Capital Auto Financial Services, Barrington, Ill.

"In companies I've seen try to set up the position, that person turns into the guy or gal with the steno pad. They become very high-priced clerks and fail miserably."

— **Cheryl Currid,** *president, Currid & Co., Houston*

SECOND TRY

Unum Life Insurance is giving the account manager position another shot

After a 15-year hiatus, the position of business account manager has been resurrected at Unum Life Insurance Co. in Portland, Maine. And this time, Dick Curry says, the liaison role won't "take on a life of its own."

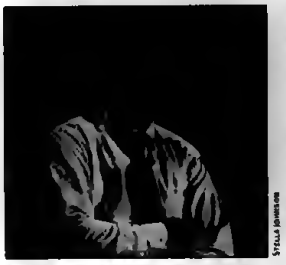
"When we first tried it, liaisons worked well for about a year or two, but then people started abdicating their responsibilities" to IS account managers, recalls Curry, vice president of enterprise technology services (ETS).

Among other things, users would turn over application testing and specification writing to IS liaisons. This effectively worked to sabotage one of the program's key goals, which was to align IS solutions with users' needs.

"So after a while, we recognized what was going on and disbanded the [liaison] unit," he says.

But Curry says Unum has learned from past mistakes. This time around, business users, IS staffers and account managers all have very specific roles and responsibilities concerning design, testing and other tasks for which they are individually accountable.

What's also new, he says, is that the company has changed about 70% of its business processes under a recently completed re-engineering project. In fact, Curry says, results of that study are largely responsible for account managers being reinstated.



STELLA JOHNSON

Unum Life Insurance Co.'s Dick Curry says his company has learned from past mistakes and will revive the liaison position

"In spite of all the formal planning we had in place, we found that one of our major weaknesses was clear communications in both directions," Curry says. "That's why communication is such a key part of the [new] account manager role."

Unum already has hired one account manager from the ranks of IS. Curry, to whom the position reports, is currently interviewing for two more. So far, several candidates have applied from both the IS and business sides of the house.

Curry says the position will be evaluated after six months and again after one year. Account managers' performance will be based on both users' IS costs and the results of business user surveys conducted annually by ETS.

Because all IS services are charged back to business units, Curry says ETS will be able to quantify on a unit/cost basis whether business users are indeed making better use of information technology. —*Julia King*

personality test administered by an outside firm.

"We figured ahead of time the skills and personalities we needed, then chose [account managers] based on personality test [results]," Seral says. "We were trying to avoid too many [of the same] personality type because you can't have all drivers or all innovative people. You need a mix."

GE is now tying a portion of account managers' annual salaries — which range from $40,000 to $110,000, including incentive pay — to their success in completing projects to users' specifications. Seral has also dedicated account managers exclusively to mission-critical projects, such as the automated underwriting system now under development.

"The project [represents] a quantum leap in the way we underwrite," Seral notes. As such, it demands a very high level of cooperation among departments. That in turn requires the full-time dedication of all four of the company's account managers. Without this very focused effort on the part of all four managers, Seral says, cost overruns and delays would be inevitable.

Account managers should also have thick skins because they're frequently the target of criticism and resentment, at least initially. It is also not uncommon for former colleagues to shun them as turncoats because of their new role as user advocates.

In San Diego County, this issue came to a boil when layoffs were proposed as part of an overall budget-cutting plan. Application staffers went before the county's Board of Supervisors to suggest that account managers — rather than people who do "real work writing programs" — be the first to get the ax.

Early on, account managers had similar problems at Pittsburgh-based PPG Industries' coatings and resins group. PPG first installed business analysts in 1989 as part of a strategic company-wide reorganization. All four of the analysts were selected from the ranks of IS, then schooled in the paints and coatings business.

> **"It's not that they do things that are impossible to get done. They just make it possible to get going and get moving a lot faster. . . . Account managers can cross all department lines and are able to talk to anyone."**
>
> — **Bob Modell,** *manager, information technology division, San Diego County Department of Social Services*

"Normally, you put very high performers in these jobs. What happens then is that they come back to old friends and buddies in IS and put those same expectations for performance and high delivery on them," says John Pedrotti, manager of consulting services at the company.

In the beginning, there was resentment among IS staffers, who believed analysts were lobbying perhaps too hard on behalf of users, he says. But this more or less dissolved once analysts explained users' needs to IS staffers in IS terms.

Pedrotti says a business analyst's first priority is learning the business. "That includes learning who our customers are, about market share, about who it is the business serves and what drives them," he says. The next step: working with business units to bolster PPG's knowledge and/or position in any one of those areas.

So far, Pedrotti says, this process has yielded benefits beyond his or any PPG executive's initial expectations.

One example is the PC-based paint-matching system that business analysts stirred up two years ago. The idea came during a brainstorming session with PPG business users who needed access to color information stored elsewhere in the company. Users got what they needed. PPG also sold more than 2,000 PC-based systems to auto body shops, and the system continues to be enhanced as a commercial product.

Five years after their introduction at PPG, account manager jobs are now "highly sought after by IS people," Pedrotti says. Each time he has posted that position internally he has received a minimum of 20 applications from staff in the company's 700-person IS department. The primary reason, he says, is the respect the position and the people in it have earned.

For other companies looking to attain the same kind of success, patience is a must.

"Don't expect miracles the first year," Bernstein says. "It will take two to three years before you start seeing a difference in the way things happen and in customer acceptance."

And that, of course, is only at companies where the concept gets off the ground.

"As recently as five years ago, it was greeted with great skepticism," Koeller says. Today, he says, despite the handful of success stories, that hasn't seemed to change all that much. ■

King is a senior editor at *Computerworld*'s mid-Atlantic bureau.

FEAR, UNCERTAINTY, DOUBT

IS executives may experience the following side effects when establishing the IS account manager position:

- Skepticism about the account manager's role or value to the organization.
- Ostracism of account managers by their former IS colleagues.
- Fear that overeager account managers will upset the power structure.
- User concern over who will foot the bill for the new position.

The first priority for the IS account manager is to learn the business: who the customers are, the market share, who the business serves and what drives the customers. The next step is to work with business units to bolster the company's knowledge and/or position in any one of those areas.

Source: John Pedrotti, manager of consulting services, PPG Industries, Pittsburgh

A Whole Different Ball Game

Thinking of turning systems analysts into account managers? Think again.

Traditional systems analysts do not make effective business account managers.

So if you're considering having systems analysts pull double duty and act as liaisons between users and IS, stop.

It's a big mistake, according to Mary Boone, vice president of NDMA, Inc., a Ridgefield, Conn., consultancy that trains business account managers.

More often than not, systems analysts can bring several liabilities to the liaison role, Boone says. Among these are technology bias and a lack of so-called soft consulting skills, such as good communication abilities.

"For people with a specific expertise, such as mainframes, PC or LANs, it's hard to remain unbiased in recommending solutions to clients," Boone notes. Systems analysts, she says, will most likely recommend technologies they know best, even if they are not the most appropriate.

In contrast, business account managers should act as "change agents" in the various business departments in which they work.

IS account managers require skills rarely found in systems analysts, says Mary Boone, vice president of NDMA, Inc. in Ridgefield, Conn.

"They're out there to change perceptions among the client base about what [information technology] can provide," Boone says.

Among other things, she says account managers should be trained in clear methods of measuring the benefit of information technology solutions as well as in brokering contracts.

"One of the biggest problems between [IS] and user departments is that clear contracts are not drawn up and then adhered to," Boone says.

Ultimately, she concludes, "one of the biggest pitfalls is taking a systems analyst, plopping them in this role and expecting the whole thing to fly."

—Julia King

patagonia's Enfant Terrible

A clothing retailer bets that a 31-year-old nontechnologist can succeed as CIO

By Lynda Radosevich

Ed Schmults, director of information services, Patagonia

By Lynda Radosevich

As do other new executives who wish to shake up their information systems organizations, Alison May, the 44-year-old president and general manager of Patagonia, Inc., brought in a new chief information officer from outside the IS organization.

But what made this move unusual was that this new head of systems is a 31-year-old with no technology background.

"I was very determined not to have a traditional information systems person in that job," says May, who took the helm of the Ventura, Calif.-based sports clothing company in December. "The problem with IS is that there is very little knowledge of the business process. I think the decisions tend to be less strategic in nature than someone with a business background would make."

Listening to users

For instance, the $130 million company's IS group became too focused on programming its manufacturing and inventory system and did not pay enough attention to users and their need to work with customer-related information, according to May.

So two months ago, May appointed Ed Schmults, a business manager and surfer with no IS experience on his resume, as director of information services. Schmults had spent the previous two years as managing director of Patagonia Japan, a semiautonomous, $11 million unit where Schmults says he learned to take care of management problems on his own. Prior to that, he had managed strategic planning for Patagonia, worked briefly for a management consulting company and attended Harvard University Business School.

Because Schmults had proved in Japan that he was good at learning processes and managing people, May decided he could help the IS group rethink its priorities.

"We take outdoors people and teach them to be businesspeople, so why not take a good businessperson and teach him to be a systems person?" May asks.

> "We take outdoors people and teach them to be businesspeople, so why not take a good businessperson and teach him to be a systems person?"
>
> Alison May, president and general manager, Patagonia

While appointing a neophyte IS director appears to be a radical step, analysts familiar with Patagonia say it fits in with the company's nontraditional culture.

"In a company like Patagonia, it doesn't surprise me," says Jim Peters, a partner at Ernst & Young's Woodland Hills, Calif., entrepreneurial service division.

That is because Patagonia is well-known in retailing for unconventional business practices. For instance, in the middle of a profitable streak in 1991, company founder and former president Yvon Chouinard decided to drop 30% of its product line and lay off 150 people for philosophical reasons. Also, the company gives away 1% of its total sales, which reached $130 million in 1993, to nonprofit environmental groups. Last fall, it began producing fuzzy pullovers that are made from 80% recycled plastic bottles.

Schmults says he is not worried about his lack of strategic-level systems experience: "My role in management is to look across the industry, see where information is used, then marshall resources and get allies in the company."

Schmults, who taught himself to speak Japanese, says his first goal in the new position is to learn the language of the computer industry. He also plans to take a LAN course on Novell, Inc. networks at a local college.

His initial IS goals are to update home-grown ordering, inventory control, shipping, delivery and warehousing systems and tie together Japanese, European and U.S. divisions. He will also focus on increasing management and end-user access to information. ■

Radosevich is a *Computerworld* senior writer.

One technology Patagonia isn't likely to deploy soon: on-line catalog and ordering systems. The company saw few new orders when it posted its catalog on Prodigy last year, says Ed Schmults, director of information services.

Executive Track

Lam Research Corp. in Fremont, Calif., has announced the appointment of **Ben Ballard** as vice president of information technology and chief information officer, a new position reporting to Henk Evenhuis, Lam Research's senior vice president of finance and chief financial officer. Ballard, who manages a staff of more than 40 information systems professionals, is chartered with building a next-generation computing infrastructure and business applications systems.

Ballard has more than 25 years of experience in information management. Prior to joining Lam Research, he spent four years at Intel Corp. where he served as applications systems integration manager of the information technology organization. He helped redirect Intel's application development process to focus on achieving enterprise systems integration.

He has also held several top-level IS positions, including corporate director of MIS at Ampex, vice president of MIS at Computerland Corp. and senior director of service bureau operations at Itel Corp.

SNET Publishing in New Haven, Conn., has announced the appointment of **Charlotte Denenberg** as chief technology officer. She will continue in her current role as vice president of network technology. Prior to joining SNET in 1987, Denenberg was director of technology evaluation and support at the ITT Advanced Technology Center in Shelton, Conn.

Computer Task Group, Inc. in Buffalo, N.Y., has announced the appointment of **Louis J. F. Boyle** to the newly created position of CIO. Boyle will be responsible for establishing and implementing a corporate IS strategy.

Prior to joining Computer Task Group, he was with Coopers & Lybrand, most recently in Londonderry, N.H. Boyle has also served as a consultant at Peat Marwick Main & Co. and Arthur Andersen & Co. as well as served as vice president of MIS at Future Electronics, Inc.

Advanced Promotion Technologies, Inc. in Pompano Beach, Fla., has announced the appointment of **Craig Boyle**, 45, to the newly created post of vice president of MIS and operations. Boyle, who comes from data vendor National Demographics & Lifestyles, Inc. in Denver, will manage the data center, which supports a growing network of electronic marketing terminals installed at supermarket checkout lines.

The NWNL Cos. in Minneapolis has announced the appointment of **David N. Rasmussen** as second vice president and strategic systems officer. In this new position, he will oversee the company's strategic use of technology to better serve customers, increase revenue and improve efficiencies. His duties will include developing and implementing the company's application systems blueprint, developing and maintaining a systems architecture and defining systems management standards and methodologies. Rasmussen will report to Robert C. Salipante, senior vice president, strategic marketing and technology. Prior to joining NWNL, he held a number of management positions during his 18-year tenure at Digital Equipment Corp.

Max D. Hopper, chairman of AMR Corp.'s Sabre Group, which operates American Airline's reservation system, has been elected a director of **Legent Corp.** in Herndon, Va.

American Cyanamid Co. in Clifton, N.J., has announced the appointment of **Bill Bock** as acting director of IS services for the company's agricultural group. Bock will fill the vacancy left when former IS director William Zeltz left the company earlier this summer.

National Grange Mutual Insurance Co. in Keene, N.H., has announced the appointment of **Edward Oakes** as systems manager in systems development. He will report to Roger Chicoine, director of rating systems development. Oakes will be responsible for leading and managing projects and project teams in the assigned risk automobile systems development area. Before joining National Grange Mutual, he worked at Fidelity Investments in Boston.

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Calendar

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1994 International Client Forum. Orlando, Fla., Sept. 11-14 — Contact: Susan Spatafora, System Software Associates, Inc., Chicago, Ill. (312) 641-2900.

The 1994 International Communications Association's Management Institute. Evanston, Ill., Sept. 11-14 — Theme: "Technological Change: Strategies for Information Systems and Telecommunications." Contact: International Communications Association, Dallas, Texas (214) 233-3889.

Forum '94. Denver, Sept. 11-14 — Contact: Laurie Haberthier, Storage Technology Corp., Denver, Colo. (303) 673-5524.

Personal Communications Services (PCS) Auctions: Getting an Edge on the Competition. Washington, Sept. 12 — Focus: the Federal Communications Commission's broadband PCS auction rules, applying game theory principles to competitive bidding, strategies for combined bidding, opportunities for designated entities and decision-support systems development. Contact: Telestrategies, McLean, Va. (703) 734-7050.

First Annual Conference on Cable TV. Washington, Sept. 12-13 — Focus: Industry trends, opportunities and strategies for equipment vendors, regulatory and financial opportunities and technological issues. Contact: Wanda Napolitano, Frost & Sullivan, New York, N.Y. (212) 964-7000.

Smart Color '94. Stanford, Calif., Sept. 12-13 — Topics include overview of color engineering and standards, device-independent color in operating systems, analysis and design of Smart Color scanners, monitors and printers, analysis of color management systems and ColorSync 2.0 workshop. Contact: Stanford University, Stanford, Calif. (415) 715-6275.

Advanced Information Management Conference. San Francisco, Sept. 12-14 — Theme: Best-of-practice strategies for applying advanced technologies to build flexible architectures supporting business process re-engineering. Sponsor: Meta Group, Inc.'s Advanced Information Management Strategies Service. Contact: Meta Group, Westport, Conn. (203) 226-6382.

Commercial Parallel Processing Conference. Chicago, Sept. 12-14 — Contact: CMP Trade Show & Conference Services, Jericho, N.Y. (516) 733-6827.

TransForum '94. New York, Sept. 12-14 — Contact: Madelaine Morgan, Arlington, Va. (703) 284-5354.

Electronic Commerce: Helping to Reinvent Government. Washington, Sept. 12-15 — Features sessions on technology applications and management issues and practical how-to ideas for government agencies and vendors. Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

Networld/Interop '94: The Networking Summit. Atlanta, Sept. 12-16 — Contact: Ziff-Davis Exposition and Conference Co., Foster City, Calif. (415) 578-6900.

Distribution/Computer Expo '94 East. Atlantic City, Sept. 13-14 — Contact: *C.S. Report*, Unwehland, Pa. (610) 458-6410.

The 1994 U.P.C. Conference. Dallas, Sept. 13-14 — Focus: Product code standards that serve as enabling tools to connect the physical flow of the product with the critical flow of information about the product. Keynote: David M. Carlson, senior vice president of corporate information systems at Kmart Corp. Contact: Uniform Code Council, Inc., Dayton, Ohio (513) 435-3870.

CompuExpo. San Jose, Calif., Sept. 14-16 — Topics: "MicroProcessor Opportunities for 1995 and Beyond," "Operating Software: Alternatives to Windows" and "Hand-Held Computing: Where Is the Market." Contact: Miller Freeman, Inc., San Francisco, Calif. (415) 905-2354.

SEPT. 18-24

1994 Symposium on Human Interaction with Complex Systems. Greensboro, N.C., Sept. 18-20 — Topics include: "Modeling Complex Adaptive Systems for Design of Work Support" and "Enterprise Support Systems." Contact: North Carolina A&T State University, Greensboro, N.C. (910) 334-7780.

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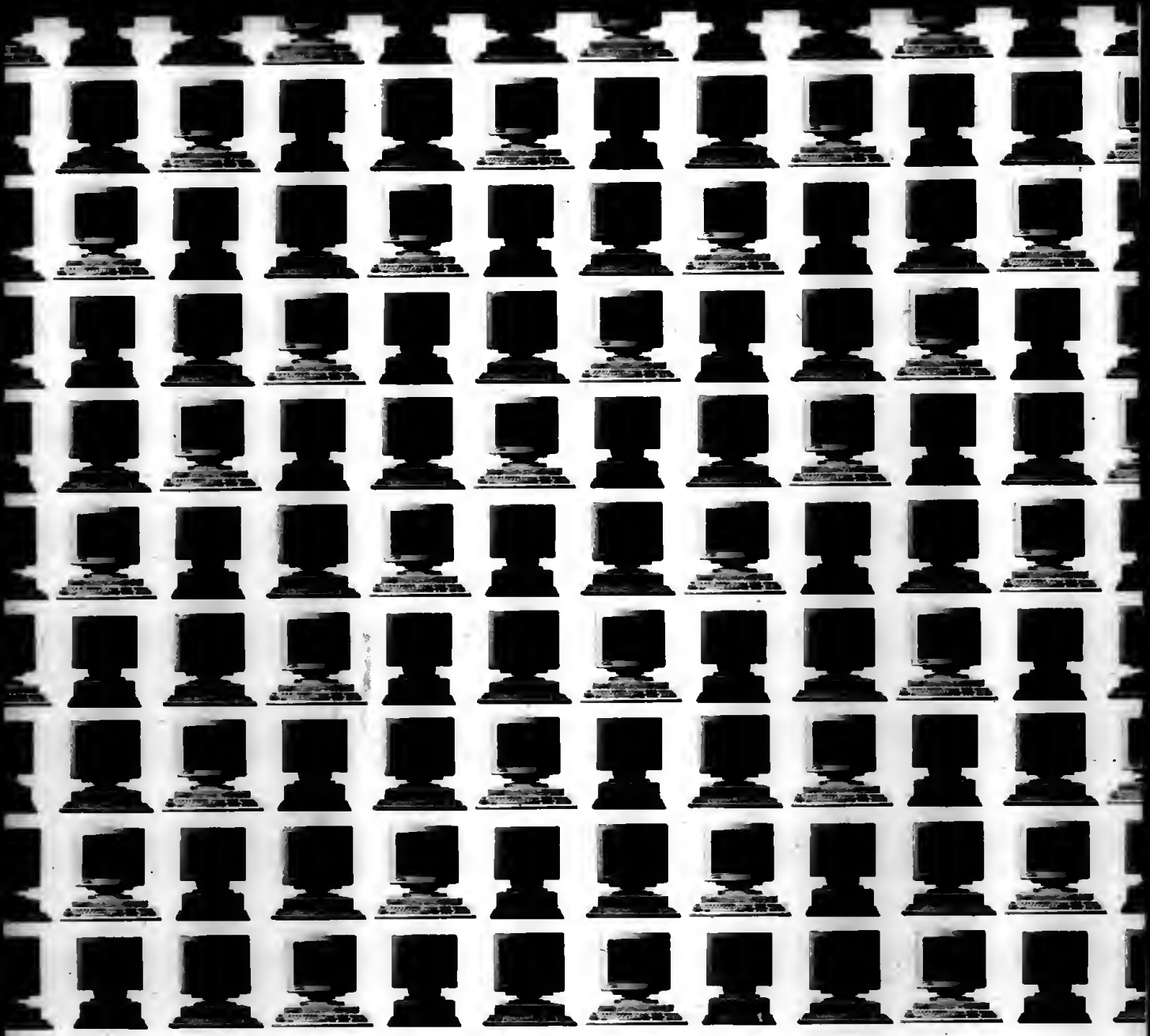

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The CW Guide to Midrange Systems

FIRING LINE

Digital's latest savior, the 2100 Server, thrills users with its performance and woos them with its price. See rumsfeld on page 102.

Thrust into a standards world, midrange vendors are finding they must make their traditional systems much less expensive and more flexible. Amid all the product transformations, we ask:

☞ *What's in it for users?*

SPLIT DECISION

Daniel Baptista

Open systems is the goal for midrange vendors, but there is no common path. Hewlett-Packard Co. offers a common hardware platform featuring Posix-compliant MPE-IX on the HP 3000 series and HP/UX on the HP 9000. IBM is trying to merge the AS/400 with the RS/6000 without losing the "personality" of either system. Digital Equipment Corp. has come up with the high-performance Alpha alternative to the VAX and turned VMS into a standards-compliant OpenVMS. And viable Unix alternatives are available from Sun Microsystems, Inc., AT&T Global Information Solutions, Unisys Corp. and Groupe Bull.

Such buying choices, like votes in Congress, can lead to split decisions.

The fallout from this turmoil is a strange parity between old and new. This state is reflected in *Computerworld*'s Buyers' Satisfaction Scorecard, which shows that users' views of the different systems are separated by the slimmest of margins.

The stories and charts on the following pages provide analyses from top experts that sort out the confusion. They may also give you ideas that will help you decide which way to swing the vote.

—Michael Sullivan-Trainor

BUYERS' SATISFACTION SCORECARD: OLD vs. NEW

Users give old systems an edge in reliability, support and operating environment, while new lines are rated highly in cost, interoperability and storage. All ratings are weighted by importance to users and are based on a 1-to-10 scale, where 10 is best. RESPONSE BASE: 50 users per product.

HEWLETT-PACKARD CO.		IBM		DIGITAL EQUIPMENT CORP.	
HP 3000 OVERALL SCORE	HP 9000 OVERALL SCORE	AS/400 OVERALL SCORE	RS/6000 OVERALL SCORE	VAX OVERALL SCORE	ALPHA OVERALL SCORE
6.4	6.6	6.4	6.5	6.2	6.4

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digital

Hewlett-Packard: Open hardware across the board, but beware of operating system trade-offs

Current and prospective users of HP business systems have a rare opportunity to choose an operating environment without serious regard for interoperability issues. The HP 3000 900 series is virtually identical to the HP 9000 800 series at the hardware level.

The Buyers' Satisfaction Scorecard survey reveals the commonality between the two product lines, particularly in areas of performance, cost and scalability. Only the HP 9000's superior storage capacity and Unix interoperability put any distance between the systems among the 100 HP users surveyed.

The survey was conducted by First Market Research in Austin, Texas, using a random sample provided by the *Computerworld* Database Division.

With the release of Posix-compliant MPE, compatibility between the proprietary and open platforms has achieved such a level that the choice of which server applications to deploy can be made strictly on the basis of price, performance and features.

The criteria for selecting the HP 3000 or HP 9000, then, is software-based. Here there are many significant differences.

MPE/IX is the proprietary operating system that makes a PA-RISC server an HP 3000. It has the following advantages over Unix:

The 3000 at most never goes down, users say

- Batch processing facilities are built in.
- MPE's built-in print spooler provides a rich and powerful print environment virtually transparent to the programmer and user.
- The system's two built-in database management system environments, Allbase/SQL and Image/SQL, are closely integrated into the operating system with high data integrity, superior performance and ANSI-standard SQL. Image/SQL also provides a transparent migration path for current users of HP 3000 Image applications. Image is the current version of the original DBMS designed for the 3000 in 1974.
- MPE incorporates many features to support security, data integrity, high availability and rapid crash recovery for mission-critical applications.

HP/UX, the operating system that turns a PA-RISC server into an HP 9000, also has advantages.

- It is System V Interface Definition-compliant and incorporates Berkeley extensions. Any Unix developer or systems administrator can sit down at an HP 9000 and go right to work.
- The system offers built-in Advanced Research Projects Agency (ARPA) services, Berkeley sockets communications capability and Network File System. These cost extra and can be awkward options on MPE.
- It allows the development of custom and third-party device drivers. This is why HP usually offers its own new peripherals, such as digital audio tape drives and optical jukeboxes, first on the HP 9000.
- The development environment supplied with HP/UX is standard Unix. It includes all of the features that make Unix so convenient for software development. Visual editors, file search utilities and the like are all available for MPE, but they come at extra cost from third-party suppliers.

SPLIT DECISION

The choice between HP's proprietary and nonproprietary platforms depends on the user's current environment. The following are points to consider:

If your third-party application of choice runs on the HP 3000, don't worry. You have lots of company. Continuing advances in PA-RISC hardware will continue improving HP 3000 price/performance right beside the HP 9000.

Consider the operating environment where the application will be deployed. HP 3000s are easier to understand and manage for an inexperienced user in a remote location. The 3000's superior data, batch and systems management features make it the lead candidate for lights-out operations, branch office servers and downsizing mainframe applications. These differences are highlighted in the Buyers' Scorecard survey by slightly higher ratings for reliability and technical support.

However, HP 9000s are more flexible, more adaptable to exotic hardware and easier to integrate into ARPA-based networks. Any shop with no HP experience but extensive Unix experience will have a much easier time managing an HP 9000.

9000 users like the capacity offered by its broad product line.

If you decide to develop custom applications on the HP 3000, be prepared. Experienced HP 3000 professionals are hard to find, and many of the third-party development tools they use cost extra. ■

Written by Eric S. Fisher, a principal of Fisher Systems Consulting, a systems design, development and integration consultancy that focuses on HP environments.

BUYERS' SATISFACTION SCORECARD

All ratings are based on a 1-to-10 scale, where 10 is best
Categories are weighted by importance to the users surveyed.

HEWLETT-PACKARD CO.		
HP 3000	[illegible]	[illegible]
6.4	OVERALL SCORE	6.6
8.1	RELIABILITY	7.8
7.6	SUPPORT	7.4
6.7	STORAGE	7.3
6.0	COST	6.1
6.5	OPERATING SYSTEM	6.3
6.4	SCALABILITY	6.5
5.7	APPLICATIONS	5.9
5.2	INTER-OPERABILITY	5.9
5.7	PERFORMANCE	5.9

SPECIAL ADVERTISING SUPPLEMENT

August 29, 1994

White Paper

Patricia Seybold Group

Workflow Technology

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Introduction

Although workflow, in the generic sense, has been around as long as there has been work, the intricacies of the workflow process have become far more meaningful since our industrial society has given way to an information-based workplace. Now, the flow of work can deviate from its static, linear path in ways that greatly alter its final outcome and value.

The dramatic increases in productivity that can accompany these changing workflows are increasingly manifested via business process re-engineering, a powerful engine for change that has become an imperative in the unforgiving arena of global competition.

The key characteristics of a workflow system — tasks, people, tools and data — rely on several critical building blocks in order to realize their ultimate expression. These building blocks are known as the three "Rs" and three "Ps" of workflow architecture. When the right routes, rules and roles are combined with the proper processes, policies and practices, workflow technology becomes a powerful application enabler.

This technology is typically expressed in three client/server-based workflow application modules: mail-based, shared database and client/server database.

In the mail-based model, all of the workflow functionality resides on, and is executed by, the client, with only the actual messaging functions occurring on the server. While this model supports remote users, multiple network operating systems and multiple client platforms, the rules that govern it are complex and difficult to manage.

The shared database model is similar to the mail-based model in that all processing is done on the client. However, documents are stored in a shared database on the network as opposed to being moved around via the mail system. Its strengths are its continual access to documents and user-friendly management capabilities, while its major limitation is its need to be connected to the database.

The client/server model extends the shared database model by storing and executing rules on the server. The server runs processes or agents that determine the next step in the workflow. It can also monitor workflow status and alert someone if a task is overdue. The client/server model's primary strength is its ability to control the workflow from the server, while its most prominent weakness is its need to access the network, which can be a burden for remote users.

However the technological direction of workflow evolves, its future as a foundation for change is secure. How fast and how widely it is deployed depends on the willingness of organizations and businesses to work for change.

This White Paper is written by Ronni Marshak of the Patricia Seybold Group.
She can be reached at (617) 742-5200.
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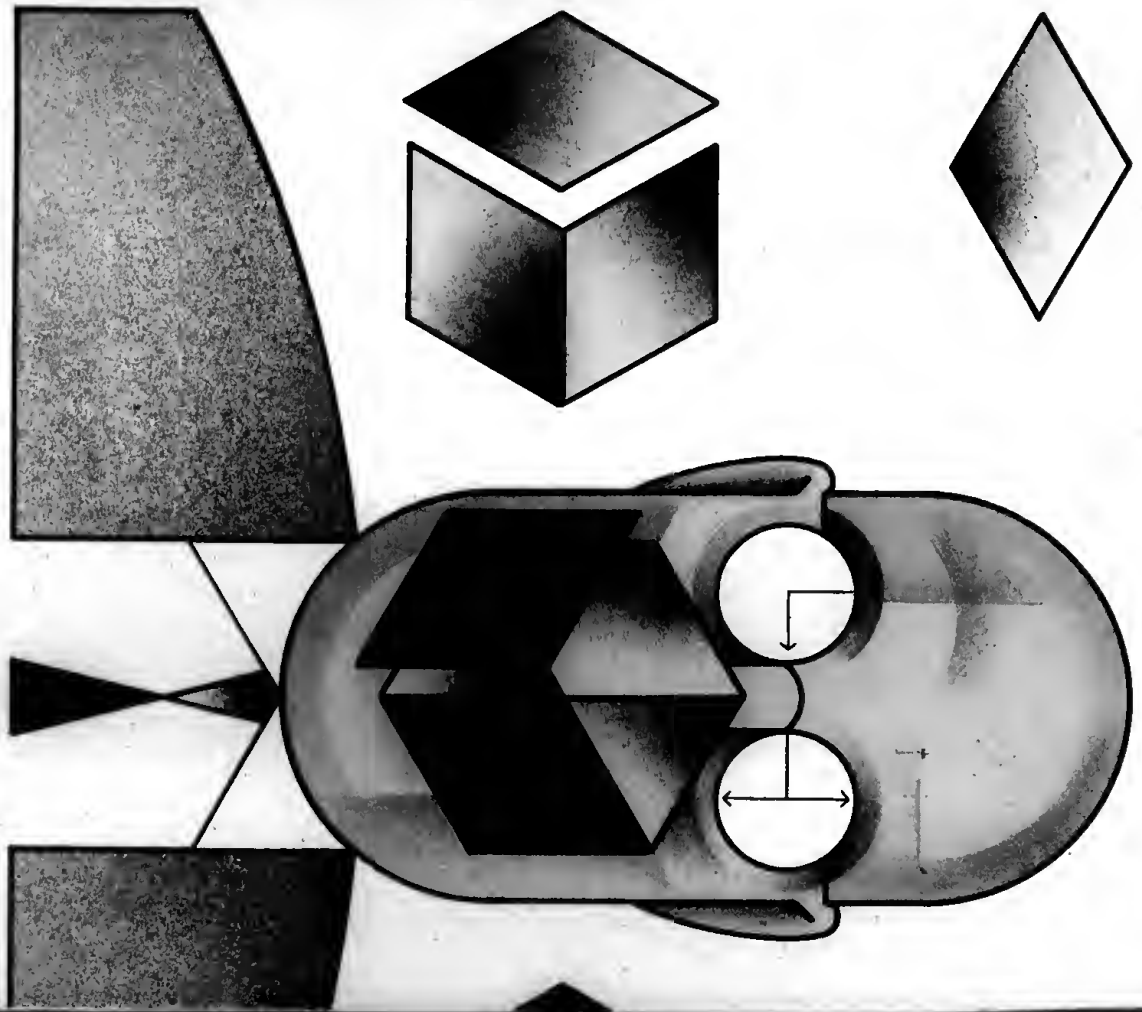


Workflow Technology

Contrary to popular belief, workflow computing is not mysterious. It is, simply put, the automation of the processes that we use every day to run our businesses. A workflow application automates the sequence of actions, activities or tasks used to run the process. This includes tracking the status of each instance of the process and providing tools to manage the process.

Workflow computing is not a complex concept. This is not to say, however, that developing and implementing workflow applications is easy. On the contrary, defining effective business processes, applying technology to them and rolling them out to a wary user base takes a great investment in both time and money.

Today, when we discuss workflow applications, we are basically talking about moving information to the right people in the right order, and providing the right tools with which to process that information. As this broad definition suggests, workflow technology, while rapidly evolving, is still in its formative stages. That means the marketplace is dynamic and open to a wide range of products and services.

WORKFLOW COMPUTING AND BUSINESS PROCESS RE-ENGINEERING

Business process re-engineering has become imperative in this world of increased global competitiveness. In order to stay viable, companies must examine all of their processes, and streamline and improve them to reflect the changing nature of doing business in the '90s and beyond.

A new generation of tools — workflow application builders — is designed to allow faster development of automated processes

Automating these processes is really nothing new. Proprietary automated turnkey processes have been around for decades. But the world is moving too fast for these hard-wired legacy systems. A new generation of tools — workflow application builders — is designed to allow faster development of automated processes as well as support flexible applications that can be updated, enhanced or completely revamped to mirror how work is being done in organizations.

Enterprisewide, strategic workflow applications are often preceded by re-engineering sessions where the organization, often in conjunction with an outside consultancy, evaluates and redesigns current processes. However, workflow automation is not dependent on undergoing a lengthy business process re-engineering exercise.

Workflow applications can mirror existing non-automated processes — a situation often referred to as "paving the cow paths." This is not necessarily bad. The nature and scope of the business process determines whether a redesign session would be valuable before applying workflow technology.

CHARACTERISTICS OF A WORKFLOW SYSTEM

Tasks. An automated workflow application is made up of the different tasks or activities that must be completed to achieve a business goal.

People. Tasks are performed in a specific order by specific people — or automated agents taking the role of people — based on business conditions or rules.

Tools. The actual processing of the information within each task, such as performing a credit check or writing a letter, is not handled by the workflow application. Usually, these tasks are performed by tools such as personal productivity applications and line-of-business applications — e.g., an accounting system

COMPANY	PRODUCT	DESCRIPTION	PLATFORM	CONTACT INFORMATION
Action Technologies	Workflow Analyst	Workflow.Analyst is software to support the ActionWorkflow Methodology, based on the Flores/Winograd model of conversation and commitment management. The tool provides a graphical mapping environment where users can capture the flow of commitments and actions as well as the underlying rules.	Windows	Phone: 510-521-6190 Fax: 510-769-2013
Action Technologies	Workflow Builder for Notes, Workflow Builder for SQL	Workflow Builder includes the Analyst capabilities plus the ability to generate the application code for either a Lotus Notes environment or an SQL environment depending on the version of the product. Builder also provides the workflow management engine.	Notes server on OS/2, all Notes clients. SQL, OS/2 and NT servers. Windows clients	Phone: 510-521-6190 Fax: 510-769-2013
Advanced Development Methods	MATE	MATE is a knowledge workflow product. It is designed both to automate the steps of a process and provide the knowledge to the people who must perform the steps. The product is intended for applications where the people doing the tasks are knowledge workers. The knowledge captured includes the way each step should be handled, and the reasons, procedures, standards, pitfalls and other implications of each step. MATE is currently a vertical product that includes the knowledge set for software product development. The tool can be generalized for any knowledge set.	Windows, Windows/OS/2	Phone: 617-272-6110
AT&T GIS	ProcessIT	ProcessIT is a high-end client/server workflow system based on a customized underlying RDBMS. It includes the following products from Recognition International: MapBuilder, a graphical workflow mapping tool; WorkView; a Windows-based environment for accessing tasks; Status Monitor, an animated real time administrators' tool; and Exerciser, a server-based module that emulates workflow activity moving through the system.	Server: Unix System V.4 Client: Windows	Phone: 803-939-7748 Fax: 803-939-7545
Banyan	BeyondMail BeyondMail/ Notes Connection PowerRules	BeyondMail is a rules-based E-mail client application. The rules engine supports launching external applications, conditional routing and triggering actions based on events. Thus, business processes can be automated via a mail front end. There is a version that integrates with Lotus Notes. Mac users on System 7 Pro and System 5 often use the PowerRules product for workflow integration via PowerTalk.	Mail Systems: MHS, VINES, alternate mailer for Notes, Clients: Windows, DOS.	Eugene Lee Phone: 508-898-1000 Fax: 508-836-2880
Business Transformation Design (BTD)	Business Transformation Management (BTM)	BTM is an object-oriented process mapping tool used in conjunction with a process definition methodology based on the Flores/Winograd model of conversation and commitment management. The software differs from the Action Workflow Analyst in that it creates workflows on a time related axis. At each step, the user can assign values to the activities being performed.	Windows	Phone: 203-968-8670

COMPANY	PRODUCT	DESCRIPTION	PLATFORM	CONTACT INFORMATION
Computron	EPIC/Workflow	EPIC /Workflow is an image-oriented packaged workflow management system that provides easy to use online customization tools so end users can tailor applications without programming.	Server: Wang VS, Wang RISC Series, AS/400, HP 9000 Client: Windows, Motif, Mac, OS/2	Phone: 201-935-3400
Delrina Corp.	FormFlow	FormFlow enhances Delrina's PerForm Pro Plus by providing serial and conditional routing of forms. The product is E-mail-enabled and also supports underlying relational databases.	Windows	Phone: 800-268-6082 Fax: 408-363-2340
Digital Equipment Corp	TeamRoute	TeamRoute is an optional package in the TeamLinks environment. The product enhances DECmail by allowing serial and conditional-based routing of any document. Customized programs can be attached to the routing logic, making TeamRoute extensible	Requires DECmail or MailWorks Servers: OpenVMS Client: Windows and Mac, All-In-1 VT terminals	Dave Price Phone: 800-Digital Fax: 800-723-4431
Digital Equipment Corp.	LinkWorks	LinkWorks is Digital's object-oriented desktop environment for information sharing. It includes a GUI mapping tool for designing and running database workflow applications.	Servers: Unix (many varieties), OpenVMS Client: Windows, Mac, Motif	Dave Price Phone: 800-Digital Fax: 800-723-4431
Documentum	Documentum	Documentum is an object-oriented client/server document/image management system that provides workflow routing of objects. The system is based on relational database and object technology	Server: SunOS, Solaris, HP UX, AIX Client: Windows, Mac, Motif	Phone: 510-463-6800 Fax: 510-463-6850
Edify	Electronic Workforce	The Electronic Workforce is a software agent platform for automating the handling and communication of information. The product has three main components: software agents that perform information handling tasks at the organizational level, an agent runtime environment that administers the tool and schedules and manages agents and resources such as phones and faxes, and the Agent Trainer, a visual development tool that defines the tasks for the agents.	OS/2	Phone: 408-982-2000 Fax: 408-982-0777

— called by the workflow application or explicitly invoked by the user when needed.

Data. This consists of information that is provided as a component of a work item. Types of data include application-relevant data and process-relevant data. Examples of data include a document created with a word processor, a spreadsheet, an image, alphanumeric strings, voice, video and/or database data. A work item's requested operation may require data in support of accomplishing the objective of an activity within a process instance.

THE Rs AND Ps OF WORKFLOW COMPUTING

Though there are dozens of features and functions that are part of workflow processing, the identifying attributes of a workflow application can be simplified down to three "Rs" and three "Ps".

Routes. The first workflow products were really intelligent routers. In the imaging world, companies like FileNet and Recognition International allowed vendors or resellers (and, later, the customers) to define the order in which images were to flow. Today, it is necessary to be able to specify the flow of any sort of object — documents, forms, data, applications, etc. These objects should be able to go off on any number of different sequential routes and then reconcile into a single route at a specified point.

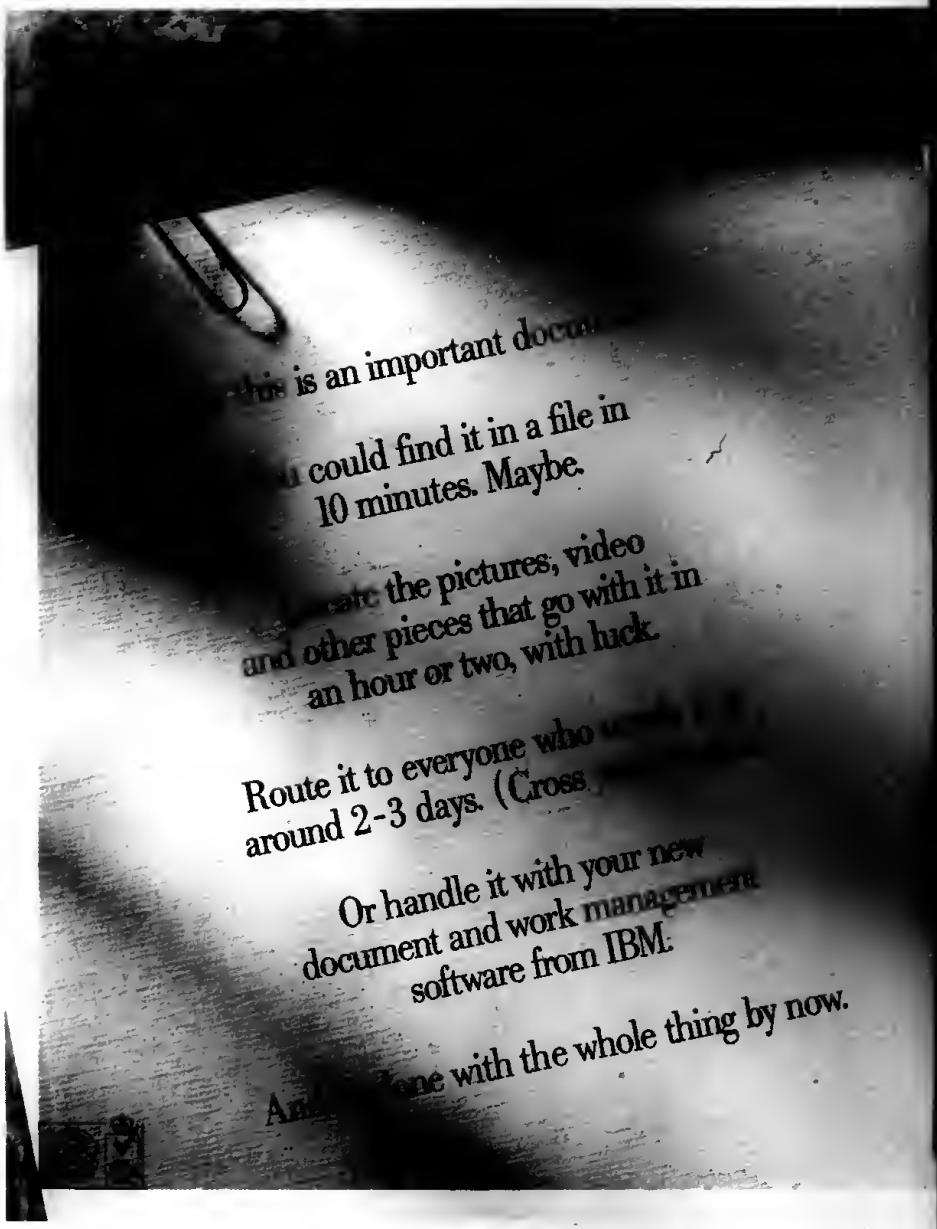
The objects should further be sendable in broadcast mode or in any order as described by the user at the time of processing. An example of this is E-mail, where everyone gets the object at once.

Rules. A more advanced feature of workflow automation, and one that makes it so valuable, is its ability to define the rules that determine what information is to be routed, and to whom. This is sometimes called conditional routing or exception handling. Conditional routing allows the system to handle more of the automatic passing of objects to the correct recipient. But capturing the assumptions describing how a business actually runs is even more valuable than defining workflow rules.

A more advanced feature of workflow automation, and one that makes it so valuable, is its ability to define the rules that determine what information is to be routed, and to whom.

Although most workflow products support it, rules definition is often accomplished via scripting or other programming activities. Some products, especially E-mail products such as BeyondMail from Banyan, offer user-defined rules engines that allow business users without any technical capabilities to write relatively complex rules by selecting options from menus and drop-down lists.

Defining the rules of a business



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COMPANY	PRODUCT	DESCRIPTION	PLATFORM	CONTACT INFORMATION
FileNet Corp	Visual WorkFlo	Visual WorkFlo is a tool that can manage, track, administrate, modify and model work processes in real time. The product provides an object oriented drag and drop environment for designing workflow applications that takes advantage of productivity tools, standard development products and legacy systems. FileNet traditionally sells in the image market but Visual WorkFlo is not limited to imaging applications. The product is tightly integrated with FileNet's imaging product line but can integrate with any other systems.	Server: RS/6000, HP 9000, HP 3000, NT by end of year Client: Windows	Phone: 800-FILENET Fax: 714-966-3490
Fujitsu	Regatta	Regatta is a GUI workflow mapping environment, application builder and management engine designed primarily as an OEM tool to be tightly integrated with other software products.	Server: Sun Solaris Client: Windows, Motif	John West Phone: 408-456-7855 Fax: 415-456-7050
IBM	FlowMark	FlowMark is an object-oriented workflow package that includes a GUI mapping environment, a deployment environment and a management engine based on an object database. The product is optimized for development teams made up of managers and professional developers.	Server: OS/2, AIX very soon Builder Client: OS/2 Runtime Clients: OS/2 now, AIX and Windows soon	Phone: 800 IBM-3333 xSTAR711
Intelligent Electronics Ltd.	W6	W6 is a work-order assignment and scheduling product that supports complex work scheduling rules with an easy-to-define front end. The product is particularly suited to processes such as fleet scheduling and complex resource allocation applications. A version is available for Notes.	Server and Client: Windows and Unix	Phone: 617-229-5888 Fax: 617-221-5692
Interleaf	RDM	RDM is a system for the tracking and management of objects throughout the document lifecycle. The product integrates workflow and document and configuration management, automating processes for assembling, reviewing, distributing and reusing documents	Server: HP 9000, RS/6000, Sun, Ultrix, VMS, Alpha by year end Client: Windows, Mac	Phone: 800-456-5323

process can be very difficult because rules can be complex and convoluted, with moltiple options, variations and exceptions. In order to define sophisticated, multipath, exception-laden processes, it takes trained programmers and application developers who can think through the entire set of possibilities that result from a single rule. However, it is also true that business users can think through the more obvious and more commonly used rules, such as, "If amount is greater than $5,000, then send it to the supervisor; otherwise, send it to purchasing."

One of the biggest areas of both potential and pain includes redesigning existing processes, eliminating the redundancies, identifying the bottlenecks and understanding why people do what they do.

Roles. It is important to define roles independently of the specific people or processes that fill that role. In the above example, what would happen if the system had routed the "amount greater than $5,000" to employee A, who had left the company? The application developer would have to specifically modify the application to indicate the new person to whom the request would be routed. If the request were sent to the "role," the administrator, not the developer, could simply change the name of the person filling the role of supervisor.

It does, of course, take the same amount of work to add a name to a role as to change the name in a single workflow step. But think about what happens if employee A is involved in multiple steps in dozens of workflow applications. The change can be made once in a role table — typically a table or database where a person is related to a role — and any workflow that involves employee A would then route the information to the replacement.

Processes. The established processes that run businesses are as varied and as personal as the people who take part in them. Often, processes are not designed but identified after the fact and extracted from common usage. We are reluctant to use the term "process re-engineering" because it implies that processes were engineered to begin with. "We have always done it this way," is a common cry when people try to examine and evaluate processes. One of the biggest areas of both potential and pain includes redesigning existing processes, eliminating the redundancies, identifying the bottlenecks and understanding why people do what they do. Business process design tools and methodologies are often employed to help define the process. Also, processes often span applications. For example, a sales process includes an order entry application, a credit check application and a billing application. All of these applications can also be considered as processes because they require a sequence of steps to be performed based on business conditions.

Policies. Policies are formal written statements of how certain processes are handled. When em-

ployees start a new job, they are handed the company policies on vacation, health benefits and sick leave. Although companies should have a formal policy for how to handle each automated business process, many do not.

Practices. Practices are what actually happen in organizations. Practices can be considered the acts of "breaking the rules" that make the process really work. For example, "Everything must go through Cheryl, unless it is product type X, in which case, we usually send it right to Henry, because he understands this type of product much better than Cheryl." Or, "Everything goes through Cheryl unless we're running more than two days late, in which case, we skip Cheryl altogether and get Henry to make sure he does a check at his end."

Far too often, when designing a workflow application, the real-life practice describing how the process evolved is ignored. Only when we capture the practices is it possible to truly automate how businesses are run.

COMPONENTS OF WORKFLOW PRODUCTS

Three workflow components — deployment environment, builder and engine — are required. Significantly, however, all three do not have to come from the same vendor.

Deployment Environment. Users must have a way of getting their job assignments, accessing the necessary productivity tools and doing their work. Lotus Notes is an excellent example of a workflow deployment environment that is separate from a workflow builder or engine. Notes does have some workflow capabilities of its own, but many workflow products, such as Reach's WorkMAN for Notes, Action Technologies' Workflow Builder for Notes, and Workflow, Inc.'s flowMaker interact transparently with Notes, providing a separate builder and engine. Some workflow implementations do not use a single deployment environment, but rather track the work as it flows among desktop applications. Basically, they infuse workflow techniques in word processors, spreadsheets, E-mail and other application tools.

Lotus Notes is an excellent example of a workflow deployment environment that is separate from a workflow builder or engine.

Builder. The workflow application has to be defined and built. Builders come in a variety of flavors, from complex scripting languages to graphical mapping and flowcharting tools. Correspondingly, they are aimed at a variety of developer skill levels ranging from professional programmers to average business users. A developer uses a workflow builder to define the rules, routes and roles of the process, as well as to identify the data, information or objects being worked on.

COMPANY	PRODUCT	DESCRIPTION	PLATFORM	CONTACT INFORMATION
Keyfile	Keyfile	Keyfile is a desktop image management environment. Keyfile's workflow software, JobMake, allows users to set up workflows using a fill-in-the-blanks format. These workflows route documents and tasks from desk to desk for approval, information exchange, mark-up and authorization. JobMaker also provides status information for job tracking and analysis.	Server: Windows, OS/2 and Unix Client: Windows	Kristina Marquardt Phone: 800-4-KEYFILE x343 Fax: 603-889-9259
Lotus	Notes	Notes provides workflow capabilities such as serial routing, status tracking and action buttons that launch scripted macros. Notes is also a popular deployment environment for workflow applications developed in other products.	OS/2, Windows, Macintosh, Unix	Phone: 617-577-8500 Fax: 617-523-9150
Novell/ WordPerfect	GroupWise 4.1	GroupWise 4.1 (formerly WordPerfect Office) supports serial routing of mail, tasks and scheduling information.	DOS, Windows, Unix, Macintosh	Phone: 800-861-2507 Fax: 801-228-5077
Novell/ WordPerfect	InForms	InForms supports forms-based conditional routing that is fully integrated with GroupWise 4.1 (formerly WordPerfect Office).	DOS, Windows, Unix, Macintosh	Phone: 800-861-2507 Fax: 801-228-5077
Portfolio	Office.IQ	Office.IQ is a document-based workflow application that organizes, shares and locates objects managed in a document database. The product includes a desktop environment for personal and shared work as well as the ability to define graphical workflow routing templates and build rule sets for the templates.	Windows	Ernie Moore Phone: 510-226-5600 Fax: 510-226-8182
Quality Decision Mgt.	Quality At Work	Quality At Work consists of three out-of-the-box, workflow-enabled applications for Notes, including QAW Project, project management with links to MS Project; QAW Service, help desk system, and QAW customer/contact management system. Also available are the QAW Business Utilities, ad hoc workflow routing forms for Notes, and QAW Business Builder, which workflow-enables existing Notes applications.	Notes	Phone: 508-688-8266 Fax: 508-688-5181
Reach	WorkMAN	WorkMAN provides a mail-based workflow builder, management engine and user environment. The product includes a graphical mapping tool to lay out the workflow, the ability to define simple rules with a point-and-click interface, and a GUI forms designer. The applications are extensible using scripting. A version using Notes as the deployment environment is also available.	Windows	Phone: 800-624-5356 Fax: 408-733-9265

The developer then binds all this to the deployment environment.

Management Engine. A workflow application must offer an underlying engine that ensures the data is being flowed to the right person (or process) in the right order, depending on the specific business conditions. The engine also tracks the location of each instance in the process. Without an engine, all the beautifully defined applications designed to run in the most advanced environments simply will not work.

The major strengths of the mail model are support for three entities: remote users, multiple network operating systems and multiple client platforms

ARCHITECTURAL MODELS FOR WORKFLOW COMPUTING

Workflow applications can be built on one of three client/server architectural models:

- mail-based
- shared database
- client/server database.

Mail-based Model

Workflow applications may be built solely on the mail infrastructure found in organizations. This architecture is most appropriate for document routing applications, such as expense requisition or purchase order approval.

In the mail-based model, virtually all of the workflow functionality resides on, and is executed by, the client, with only the actual messaging functions occurring on the server. Receiving task assignments and performing tasks are done on the client in all three models.

The key elements of the execution environment — routes, roles and rules — are all executed by one or more client processes. The data, the rules for processing the document and the document itself reside on the user's in-box. The processing rules may travel with the document or may be maintained in the user's mail application.

Assessment: The major strengths of the mail model are support for three entities: remote users, multiple network operating systems and multiple client platforms. Since the information travels to the user, it does not matter where the user resides. And, since most users are connected to some mail network, this architecture is very promising for cross-organizational workflow situations.

The downside of the mail-based approach is the complexity of managing the workflow rules. Since these rules tend to reside in multiple locations — most often in multiple users' mail applications — any changes in the process may have to be made to dozens, even hundreds, of applications that may exist on

COMPANY	PRODUCT	DESCRIPTION	PLATFORM	CONTACT INFORMATION
Recognition International	Plexus FloWare	FloWare software is a developers' tool for coordinating the interaction of an organization's documents, data and tasks. Using an independent work-in-process database, the software coordinates the movement of work between activities or applications. The product includes MapBuilder, a Windows-based graphical tool, Trailer, a tool for user access to statistics on information in the process, Status Monitor for systems administrators, and Exerciser to model the system before going live.	Server: Unix Client: DOS, Windows, OS/2, Mac, Unix	Dean Crane Phone: 214-579-6063 Fax: 214-579-6840
Sigma Imaging Systems	OmniDesk FormBuilder and RouteBuilder	OmniDesk is an image management system. Using the OmniDesk FormBuilder and RouteBuilder components, users can define forms, draw workflow maps, define roles and specify Boolean rules, all with a graphical fill-in-the-blanks front end.	Server: OS/2, NT by year end Client: Windows, OS/2	Katherine Askew Phone: 212-476-3000 Fax: 212-986-0175
Staffware, Inc.	Staffware	Staffware is a forms-based high-end workflow engine. Any file from an external application such as a spreadsheet can be used as the workflow form, or forms can be created in a Staffware forms builder There is a graphical mapping tool to allow users to lay out business processes that will generate the underlying code for the workflow management engine.	Server: multiple Unix platforms Client: Windows, character-based terminals	Christopher Fletcher Phone: 617-239-8221 Fax: 617-239-8223
Template Software	Workflow Template	Workflow Template is a GUI object-based development environment for enterprisewide workflow systems based on Template's SNAP rapid application development tool for programmers. Workflow Template supports single- and multiple-server architectures. The product includes a simulator that allows an application to be tested before implementation.	Server: multiple Unix platforms Client: Windows	Phone: 703-318-1000 Fax: 703-318-7378
UES, Inc	Knowledge Information Shell	KI Shell is an object-based generic workflow process manager shell that allows users to describe, model and enact the process.	Server: multiple Unix platforms, DEC VMS Client: Windows, OS/2	Phone: 513-426-6900 Fax: 513-429-5413
ViewStar Corp.	ViewStar	The ViewStar system provides object-oriented client/server business process automation software that combines high-end workflow capabilities with document management and image technology The product combines graphical modeling and building tools for rapid prototyping of applications. The ViewStar software supports the company's BluePrint for Success implementation methodology	Server: Unix, NT, NetWare, DOS, MVS Client: Windows, NT soon	Phone: 510-337-2000 Fax: 510-337-2222

workstations and laptops all over the world.

Additionally, in the mail model, it can be difficult to determine the exact status of a given piece of work beyond knowing it is sitting in someone's in-box. Finally, in a mail-based application that routes documents, the document is not available to anyone other than the current mail recipient.

The greatest limitation of the mail-based architecture is its inability to collect process-related "meta-management" information that helps users make business decisions. For example, it might be discovered, while processing loan applications, that a large number of successful car loan requests are coming from single women in their late 30s. A company employing the mail-based model would miss this critical information. It would also miss the accompanying opportunity to take advantage of this information by implementing an advertising campaign targeting that demographic group.

Shared Database Model

As in the mail-based model, all processing in the shared database model is done on the client. However, in the shared database model, the documents are not moved around via the mail system; although users may be notified via mail that they have a workflow task at hand. Rather, the documents are stored in a shared database on the network. The document, at least a read-only version, is thus always available for viewing.

In this model, the rules and roles may be stored separately from the documents in the same or a different database, or they may be contained within the client software, or attached to the documents themselves.

Assessment: Aside from the advantage of continual access to documents, the shared database model offers better management capabilities than the mail model, including improved rules management and status tracking. The shared database can also be used to store historical information about the workflows so that meta-management is possible.

The major limitation of the shared database approach is the need to be connected to the database. Databases that support replication, such as Lotus Notes, do not face this limitation. However, even with replication, there is no guarantee that users will access the latest version of a database.

The Client/Server Model

The client/server model extends the shared database model by storing and executing the rules on the server. The server runs processes or agents that determine the next step in the workflow. The server can also monitor the workflow status and notify participants of an upcoming or overdue task. Or, it can alert someone managing the workflow when a task is overdue.

Server-based workflow applications can also integrate with other data sources and applications. For example, a server task can monitor a specific value in a relational database, such as overdue invoices, or an external feed, such as changes in a customer's stock prices or credit rating, and launch workflow processing based on this information.

Assessment: The client/server model provides all the benefits of the shared database architecture and can easily be integrated with the mail system. Its primary strength is its ability to control the workflow application from the server. This includes the ability to monitor and manage each workflow application and meta-manage the whole business process. Storing and executing the workflow rules on the server provides a high level of maintainability for the application. The client/server model also easily permits the addition of server tasks that launch, monitor and manage the workflow application.

The client/server workflow architecture suffers similar limitations to the shared database model. Access to the network is required but replication can solve some of the remote issues. However, the client/server model may be able to handle remote users better because if a user does not act on a task within a certain amount of time, the server agent can reassign the task to someone else.

Client/server applications also require a server application in addition to the client application. This server application generally needs to run on a multitasking operating system such as Unix or OS/2, which is likely to be different from the client system, i.e., Windows or Macintosh.

WHERE WORKFLOW COMPUTING IS BEING IMPLEMENTED

Workflow processing is being implemented in four primary application types:

Image Processing. Workflow computing initially gained visibility as part of production imaging applications wherein images were scanned, collected into folders and routed in a specific order for approval or comments. When workflow capabilities — primarily routing features — were added to image processors, they were limited, requiring coding at the programmer level to create a workflow application and allowing little, if any, flexibility.

The newer generation of tools from vendors such as FileNet, ViewStar, Sigma Imaging and Recognition International are much more flexible, supporting graphical development, object-oriented designs and user-level definitions of business rules.

Forms Processing. In the mid-1980s, an English company, FCMC, now known as Staffware in the U.S., introduced forms-based workflow techniques in its Staffware work-

COMPANY	PRODUCT	DESCRIPTION	PLATFORM	CONTACT INFORMATION
Virtual Management Inc	Workflow BPR	Workflow BPR is a single-user Windows-based methodology and definition tool that maps existing business processes for the purpose of documenting and enhancing them. The methodology helps users determine the value of one alternative path of a process over another. The end product is a map of the newly defined or enhanced process. An enactment engine — workflow builder — is planned for the future.	Windows	Scott Dixon Smith Phone: 310-798-2425 Fax: 310-798-2365
Wang	OPEN/Workflow	OPEN/Workflow is a set of work management tools used to automate paper-intensive processes while integrating with existing desktop and legacy applications. The product includes a graphical workflow builder. OPEN/Workflow also includes metric comparison capabilities that measure and analyze cumulative information	Client: Windows Server: HP UX and AIX	Chris Martins Phone: 508-967-5252 Fax: 508-967-2819
Workflow, Inc	flowMaker	flowMaker is a workflow application generator for Notes that uses an outlining methodology for application development. This is a programmers' tool that provides the workflow builder and uses Notes as the management engine. No runtime version of the product is necessary. Resulting applications run in native Notes	Windows	Therese Shore Phone: 610-459-9487 Fax: 610-459-7895
XSoft	InConcert	InConcert is a client/server application that builds high-end document-based workflow applications. The product uses object technology underpinnings. InConcert supports a job-centric concept that looks at documents in relationship to the job being done.	Server: Sun, RS/6000, HP 9000 Client: Windows	Phone: 1-800-626-6775 Fax: 617-499-4409

flow processor. Originally conceived as an enhancement to FCMC's financial software products, Staffware was designed on a proprietary flat file database that held the data entered into forms designed in the system. These forms were routed based on rules and conditions of the data. Staffware now provides an open, multiplatform workflow builder and manager, and still offers a familiar forms-based front end for users.

WorkMAN from Reach also uses a forms model for routing work via E-mail. In the past two years, the popular forms design vendors, such as JetForm and Delrina, have added workflow routing to their traditional forms products, which have already been mail-enabled in conjunction with popular LAN-based mail products. As a result, it is possible to specify conditional routing of these forms via corporate E-mail systems.

Mail Rules and Filtering. In addition to using E-mail to simply route forms or other information, products such as Lotus's cc:Mail, Novell's GroupWise 4.1 (formerly WordPerfect Office) and Banyan's BeyondMail have built-in workflow capabilities. BeyondMail also includes a complete rules language and rules engine for processing mail-based rules. These rules can range from filtering incoming mail to launching external applications and macros, thus creating full workflow applications based on the mail rules.

Shared Database Applications. Unix-based — but soon to be found in Windows NT — client/server workflow product offerings such as X-Soft's InConcert and AT&T GIS's ProcessIT store information, rules and role tables on server-based relational databases, typically executing the workflow application on graphical user interface clients such as Windows. Lotus Notes, which uses a shared document database model, is another increasingly popular environment for workflow applications designed directly in Notes or developed using third-party tools from the many Notes Alliance Partners such as Quality Decision Management, Workflow Inc., Action Technologies and Reach Software.

WHAT IS NEXT FOR WORKFLOW COMPUTING

As defined in this White Paper, workflow processing presides over services such as document management, time management and messaging. Customers use workflow application builders as the development and deployment environments for automated processes.

However, an alternative view of workflow computing modeled on Microsoft's concept of groupware is emerging. This new method enables all workgroup software by providing group functionality in the operating system rather than in specialized products. Take, for example, a document management application. Users are familiar with their document manager, using it to save and locate documents, to check in and out of documents, and to maintain version control. By adding workflow capabilities, they will be able to route these documents based on certain rules and/or conditions. Rather than building a workflow application in a new paradigm, users will to be able to add workflow capabilities to the existing document management application.

In reality, almost every business application written is a workflow application — automating business processes to get work done by a group of people. Because of this, the term "workflow" will eventually disappear. It will simply be synonymous with application development. ■

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Trade and business press hail workflow as the method of choice for supporting business process re-engineering and automation. Workflow technology keeps information flowing properly within an organization's framework and insures that the proper items make it to the proper people at the appropriate time. **Workflow '95** will answer key questions to be asked by any organization planning to implement or currently implementing workflow technology.

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Workflow Technology

IBM: What personality is my server? Merging products raise new options. How about PC apps on an AS/400?

Although IBM's AS/400 and RS/6000 midrange systems seem to overlap in capacity and capability, each has a unique personality that appeals to certain types of users.

The Buyers' Satisfaction Scorecard results prove this point by turning up nearly even ratings for the two products. Each was rated by a 50-user survey based on a random sample.

Nevertheless, the market has forced IBM to make its systems interoperable. The AS/400 has become increasingly open to standards such as TCP/IP, a native aspect of the RS/6000's Unix system.

Next, IBM plans to bring these two products closer together "under the covers" while allowing each to retain its own identity. This strategy will reduce development costs and protect investments in existing systems.

The AS/400's personality is based on highly integrated system software. Buyers don't have to integrate numerous middleware products, which makes AS/400s easy to set up, operate and program. Software integration has also helped create a library of applications.

The Scorecard survey reveals higher satisfaction among AS/400 users in operating system and applications, reflecting its ease of use and variety of third-party options. Cost — based largely on hardware prices — also differentiates the two products, with the RS/6000 coming out ahead.

AS/400 hardware can cost twice as much as Unix systems. Hardware, however, is only a fraction of the total cost of owning a computer. When system software, middleware, maintenance, technical support and operations are considered, the AS/400 may be the lower cost option.

The RS/6000 offers a different set of advantages. Hardware costs tend to be low and drop constantly. It offers excellent processing performance and tends to be ideal for engineering, scientific and graphics applications.

RS/6000 systems offer a rich variety of middleware products such as database management and security systems and transaction monitors.

IBM wants to reduce development costs while offering the market two choices. The AS/400 and RS/6000 will both be key IBM products for a long time. Development costs will be reduced by using common technology building blocks.

PowerPC RISC processors will be the first common element. The RS/6000 already uses them, and the AS/400 will follow in 1995. PowerPC chips will help bring the cost of AS/400 hardware in line.

IBM is creating a common software foundation for its major operating systems (OS/400, AIX, OS/2 and MVS) by having them share a set of core functions called Workplace. These functions include communications, device drivers, object technology and distributed computing capability. The common software foundation will be achieved by having OS/400, AIX and OS/2 built on top of a standard microkernel.

Workplace elements will not make up a complete operating system. They must be combined with a personality such as OS/400, AIX, OS/2 or even MVS to form a workable system. The use of common hardware and software building blocks will create an interesting option. It will be possible to combine personalities on a single system. For example, future AS/400 systems will be able to run AIX and PC server applications.

The Workplace strategy will have a great impact on AS/400 customers. The combination of PowerPC microprocessors and common hardware and software elements will improve price/performance dramatically. Improvements will come as field upgrades to existing systems and will provide investment protection. The common building blocks also mean product improvements will come at an even faster pace.

The AS/400 will also become highly open, able to run almost all popular software applications. It will support the same hardware and software interfaces offered by the RS/6000. The Workplace version will retain the characteristics that make the AS/400 unique, including its integrated software.

RS/6000s will also benefit from Workplace. Common development may allow IBM to bring new capabilities — object technology and multimedia — to the RS/6000 before other Unix vendors.

IBM's highly ambitious Workplace strategy will take a number of years to evolve. If it works out as planned, IBM will continue to offer two very different options to the midrange market and provide current AS/400 and RS/6000 buyers with a safe path to the future. ■

Written by David H. Andrews, president and managing partner of D. H. Andrews Group, which specializes in advising users of IBM midrange systems.

SPLIT DECISION

BUYERS' SATISFACTION SCORECARD

All ratings are based on a 1-to-10 scale, where 10 is best. Categories are weighted by importance to the users surveyed.

IBM		
AS/400		
6.4	OVERALL SCORE	6.5
8.0	RELIABILITY	7.6
7.3	SUPPORT	7.2
6.9	STORAGE	7.1
5.7	COST	6.8
6.7	OPERATING SYSTEM	6.1
6.2	SCALABILITY	6.1
6.1	APPLICATIONS	5.7
5.2	INTER-OPERABILITY	5.8
5.7	PERFORMANCE	5.9

RS/6000's hardware, based on the RISC PowerPC, provides the lowest cost

AS/400's rich variety of third-party applications gives it the edge

WHAT TO ASK A SUPPLIER BEFORE YOU ASK THEM TO SUPPLY A CLIENT/SERVER SOLUTION

1. Will your approach to client/server
   - ☐ (A) require me to replace computers or networks I already have? OR
   - ☐ (B) protect my existing IS investment by interoperating with it?

A lot of time and money has been spent on existing systems and training. Don't throw them out if it's not necessary.

---

2. Do you
   - ☐ (A) offer client/server products as independent add-ons? OR
   - ☐ (B) offer the experience to integrate your products with my existing information environment?

No two enterprises are alike. A supplier needs broad experience integrating client/server solutions in all kinds of environments.

---

3. Do your products
   - ☐ (A) hinder access to the widest range of application software? OR
   - ☐ (B) support industry standards and the latest product releases from premier suppliers such as Novell, Oracle, Intel and Microsoft, as well as the developers who support them?

A commitment to standards and alliances with key vendors helps ensure a supplier will meet the broadest range of user requirements.

---

4. Are your client/server systems
   - ☐ (A) present-ready only? OR
   - ☐ (B) future-ready also?

Most enterprises are in business for the long run. Client/server solutions should be designed to support future generations of processor technology.

---

5. Are you
   - ☐ (A) a newcomer to transaction processing? OR
   - ☐ (B) a company with a heritage of industry-leading transaction processing solutions?

Any move to client/server involves your ability to process vital, business-critical transactions. A supplier should have extensive experience and technical expertise in OLTP.

---

6. Do you design products that
   - ☐ (A) *utilize* Intel486™ and Pentium™ processors, Windows NT,™ UNIX and other leading technologies? OR
   - ☐ (B) *OPTIMIZE* Intel486 and Pentium processors, Windows NT, UNIX and other leading technologies?

It's one thing to use the latest technology. It's another to get as much out of it as possible.

---

7. IF YOUR ANSWER TO ANY OF THE ABOVE QUESTIONS WAS (A)... WHY?
   IF YOUR ANSWER TO ANY OF THE ABOVE QUESTIONS WAS (B)... CAN YOU PROVE WHY?

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DEC: Performance is the new mantra. But is speed enough to keep the products competitive?

In November 1992, Digital Equipment Corp. introduced the AXP (Alpha) processor architecture and a line of systems designed around it. AXP systems initially failed to generate the level of interest expected. Inherent delays were exacerbated by an early lack of AXP-ready software and the company's oft-spectacular organizational and financial turmoil.

While the problems have not ended, they do appear to be decelerating. A second generation of AXP systems, the DEC 2100, debuted in April (see Firing Line page 102).

This introduction was closely followed by the imposition of a leaner and meaner organization. The combination has begun to build momentum for the company in general and AXP in particular. Servers represented 25% of AXP systems revenue in the fourth quarter of 1994. This is a substantial increase over the 10% server share early in fiscal year 1994.

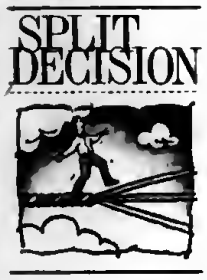
One of the most important questions for users is whether to stay with the VAX platform or embark on the AXP upgrade. While AXP offers superior price and performance, Digital has no plans to abandon the VAX. Indeed, recent VAX introductions deliver up to 60% better price/performance than their predecessors. For stable applications, a new VAX may be the most effective route.

At the same time, Alpha's AXP has brought many changes. Chief among these: a very different price and performance profile, the adoption of a modular computing strategy and a broadening of Digital's operating systems horizons. Each of these ultimately renders AXP a more attractive platform to users.

On the performance and price/performance front, AXP systems have scored well since their introduction — so well, in fact, that the normally reserved Digital has begun claiming "a sustainable performance advantage." While such claims are always contentious, they are supported by benchmark results, as well as the Buyers' Satisfaction Scorecard. Performance was the one category where Alpha outscored the other products. Ironically, the VAX received the lowest score.

The VAX price tag shows its minicomputer legacy

A total of 100 Digital users selected from a random sample responded to the survey. First Market Research in Austin, Texas, conducted the interviews using sites provided by the *Computerworld* Database Division.



Under the aegis of its "one architecture, one operating system" strategy, Digital in the 1980s promoted VAX/VMS as a unified entity. Unix support was grudgingly extended. The AXP software story is a stark contrast. It includes not only OpenVMS, but also DEC OSF/1 (Unix by another name) and Microsoft Corp.'s Windows NT.

The have-it-your-way strategy has been confusing, particularly to users accustomed to a unified message. Nonetheless, the inherent flexibility represents an advantage for users.

Of course, not all is different. Like its 32-bit predecessor, AXP appears in three grades, targeting price-sensitive, generic and performance-sensitive applications. Similarly, AXP systems continue the VAX 4000 and VAX 6000 platform strategy by supporting in-cabinet upgrades through multiple processor generations. Another common thread is the OpenVMS operating system.

Rumors of the death of OpenVMS (once called VAX/VMS) are greatly exaggerated. OpenVMS has evolved to survive in the open systems world. Digital has extended XPG4 compliance, Posix support and Unix pricing parity to its flagship operating system. Despite the enormous progress Unix and NT have made toward production readiness, OpenVMS still excels in its support for must-not-stop mission-critical applications.

During the coming year, OpenVMS will be fortified with a new log-structured file system, 64-bit file and database support, a Windows-based systems management interface and extended VMS cluster capabilities.

The company regarded VAX-to-AXP migration as a key issue, devoting at one time as much as a third of its AXP development resources toward easing the transition. One result was special AXP data formats and instructions designed to ease migration. Another result was the development of VEST — or VAX Executable Software Translator — a binary code translator that allows VAX users to run many VAX applications on AXP without recompilation, albeit often without realizing AXP's performance benefit. ■

Written by Terry Shannon and Jonathan Eunice. Shannon is a senior analyst at Illuminata, a computer technology assessment firm in Hollis, N.H. Eunice is research director at the firm.

BUYERS' SATISFACTION SCORECARD

All ratings are based on a 1-to-10 scale, where 10 is best. Categories are weighted by importance to the users surveyed.

DIGITAL EQUIPMENT CORP.		
VAX		
6.2	OVERALL SCORE	[illegible]
7.8	RELIABILITY	[illegible]
7.1	SUPPORT	[illegible]
6.2	STORAGE	7.1
5.8	COST	[illegible]
6.4	OPERATING SYSTEM	6.2
6.3	SCALABILITY	6.4
5.8	APPLICATIONS	5.4
5.4	INTER-OPERABILITY	5.5
5.2	PERFORMANCE	6.0

Users agree with benchmarks giving a nod to Alpha's top performance

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65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric
80. Manufacturer of Computers, Computer Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
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2. TITLE/FUNCTION (Circle one)

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22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr. Tech Planning, Admin Svs.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT

11. President, Owner/Partner, General Mgr
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt

OTHER PROFESSIONAL MANAGEMENT

80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems

(a) Solaris	(e) Mac OS
(b) Netware	(f) Windows NT
(c) OS/2	(g) Windows
(d) Unix	(h) NeXTstep

App. Development Products ❑ Yes ❑ No

Networking Products ❑ Yes ❑ No

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70. Mining/Construction/Petroleum/Refining/Agric
80. Manufacturer of Computers, Computer Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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Networking Products ❑ Yes ❑ No

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Migration momentum

Despite the competition among platforms, applications drive user hardware choices, as the following profiles demonstrate:

▸ Long's Drug Stores

Like many midrange systems users who want to standardize on open systems environments, Long's Drug Stores in Walnut Creek, Calif., must deal with legacy applications tied to a proprietary minicomputer platform.

The $2.5 billion pharmacy chain uses more than 300 Hewlett-Packard Co. HP 3000s as its major systems. More than 250 of them are still running HP's proprietary MPE/5 operating system. The remainder have migrated to HP's Posix-compliant MPE/IX. In addition, the stores have three HP 9000s running HP/UX and two IBM RS/6000s running AIX.

The key to Long's strategy is choice, notes William Gates, manager of technical planning.

Technical planning manager William Gates

"We haven't standardized on Unix per se but on Posix-compliant applications," Gates says. With three Posix-compliant operating systems in place, Long's "can run applications on the hardware platforms that fit our needs at the time. We want flexibility in our hardware without relying on proprietary technology," he says.

That strategy would not be possible for Long's, an HP shop since 1974, without HP's introduction of Unix alternatives such as HP/UX and a Posix-compliant version of MPE. HP's move into Unix allowed the chain to bring in three new applications: check processing, an applications development tool and network management software. The software was not available for MPE systems, but it was available for HP/UX, HP's native Unix operating system.

Long's also plans to implement Distributed Computing Environment (DCE) to manage the environment it has established. While Gates says the company has no plans to migrate applications, it will capitalize on DCE's applications interoperability to migrate data to more efficient platforms.

"We expect that MPE/IX and HP/UX will merge and that we'll be able to run all of our existing applications simultaneously on the same [HP] platform in some future hardware iteration," he says.

▸ Columbia County, Georgia

Despite the AS/400's depth of applications and ease of use, Unix platforms such as the RS/6000 have unique capabilities. Such was the case for the Columbia County government, which dipped its toe into Unix waters to handle a compute-intensive application.

The county currently uses two AS/400s running OS/400 and one RS/6000 running AIX. The Unix application is a geographic information system (GIS) to document the layout of the county, which is growing rapidly.

"We want to look at where building permits have been issued and assess growth in particular areas. This will enable us to plan for road widening, laying new water lines and so forth," says Lewis Foster, data processing manager.

The application, Arcinfo, runs on an RS/6000 Model 520 and is tied to an AS/400 database of property owner information. Columbia County has created a series of digitized maps and will overlay the property owner information for data analysis. Later, it plans to use the same setup to track crime in the area.

Foster says he knew the AS/400 lacked the computational ability to run a GIS but was tepid about Unix because few government management applications are available for it. He remained loyal to IBM when he began evaluating Unix systems two years ago because at the time, "it was the only Unix platform that communicated with the AS/400."

"We moved to Unix strictly for the graphics and computational ability," Foster says. "I think both machines work hand in hand. One will never replace the other. The market has to be more mature before you jump from one bandwagon to another. For all we know, IBM could put the AS/400 and RS/6000 in the same box. That would be great."

▸ Hubble Space Telescope Institute

True to its growing reputation, Digital Equipment Corp.'s Alpha is viewed by many organizations as an attractive alternative to the VAX when increased performance is required.

Few users have as much data to crunch as the Space Telescope Institute and its Hubble Data Archives Group. The group would rather switch than fight to keep its VAX up to speed with new processing demands.

Based in Baltimore, the Hubble group uses four Alphas running Alpha VMS and the Open Software Foundation's OSF/1. The group's mission is to manage the Hubble archives data, which is collected by the Hubble telescope orbiting the Earth, and make it available to the scientific community at large.

The switch to Alpha from VAX was initiated by the need to move away from a third-party add-on. The add-on was for a key VAX/VMS application built by a government contractor for the institute. Its function was to perform numeric and I/O coprocessing. But the system was proprietary and expensive. By porting the application to the Alpha platform, the institute got the number-crunching and I/O power it needed without the add-on hardware.

"The Alpha has the same capabilities built in, so we can get away from this device, which is not working well for us anyway," says Joseph Pollizzi, project engineer. "We'll have to rewrite the portions of the software that recognize the device and get it to recognize the facilities of the Alpha, but we'll get better performance and lower maintenance costs."

The group's most critical project — developing an object-oriented graphical user interface (GUI) that third parties can use to access the archives — has pushed it from VMS to OSF/1.

The GUI was originally built to run under VMS and Sun Microsystems, Inc.'s SunOS, and the group is beginning to port and test it on other platforms. ■

Written by Leslie Goff, a free-lance writer in New York.

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CAPACITY: 384M bytes – 512M bytes

Source: Computer Intelligence/InfoCorp and vendors

Firing Line: DEC's Alpha 2100 – Impressed by speed, users look for proof of reliability, interoperability

Digital Equipment Corp.'s 2100 Server, known as Sable, is the first in a family of RISC-based symmetric multiprocessing servers that use between one and four 190-MHz Alpha AXP processors and deliver high price/performance.

The 2100 is quickly becoming Digital's most important system. At a time when VAX sales are slow and the company needs to remake itself, the 2100 has shipped between 3,000 and 3,500 units since its introduction in April — three times its forecasted amount, according to analysts [CW, Aug. 15].

Evaluators included a printing company, a software simulator, a government agency and an insurance provider.

The survey method was developed with the assistance of Howard Rubin and Associates and Technology Investment Strategies Corp.

CRASH RECOVERY

None of the users had yet experienced a crash and said they could not effectively comment on recovery. But they said they were initially pleased by the reliability of the 2100 compared with the older Alpha-based systems.

Software simulator: "Its improved reliability is as much a function of the new version of OpenVMS 6.1 we are using as it is the hardware."

STORAGE CAPACITY

The Model A500MP supports 32G bytes of storage internally and 200G bytes externally.

Printing firm: "Our applications run great, and they require anywhere from 1G to 4G bytes. Our new application will require 30 gigs, and we do not expect any problems."

COSTS

Entry prices for a single processor box start at $18,900 for a Microsoft Corp. Windows NT-based system and at $26,900 for systems with the Open Software Foundation's OSF/1 or Digital's OpenVMS.

Government agency: "We thought about upgrading our IBM AS/400s, which would have cost us a couple hundred thousand and still wouldn't even have come close to the 2100's performance."

RAID

The 2100's internal redundant arrays of inexpensive disks (RAID) may cause some of the users to switch vendors.

Printing firm: "Because of its integration, we would like to choose DEC's RAID if it meets our performance requirements. We have had to go with Fujitsu's system in the past."

INTEROPERABILITY

Even though each evaluator was using the 2100 Server in a stand-alone setup, each was concerned about its interoperability with Intel Corp.-based systems. (See vendor response.)

SPEED OF PROCESSING

Benchmarks have placed the Alpha 2100 ahead of its competitors. But the users said it needs to be configured with multiple processors to outdistance older systems.

Software simulator: "Our 2100 is configured with a single processor, so it's a tad slower than the AXP 800."

Printing firm: "Our product's performance, which has been adapted to run on Alpha, is above any comparable product in the industry."

VALUE FOR THE DOLLAR

Neither Hewlett-Packard Co., Sun Microsystems, Inc. nor IBM has a system that can equal the 2100 Server in price/performance.

Software simulator: "The ability to pay X amount up front with the ability to add extra processors when needed made this system very attractive." ■

Written by Computerworld *senior researcher Kevin Burden.*

DIGITAL RESPONDS

INTEROPERABILITY

Digital has a wide range of client/server software that will integrate Intel PCs with the Alpha AXP. The sharing of files, printers and other network services is possible through Pathworks OSF/1 AXP and Pathworks OpenVMS AXP.

Also, the Digital 2100 Server running Windows NT can act as a file and print server for an Intel PC. Through Digital's implementation of DCE, users can integrate applications across Intel PCs and Alpha AXP servers.

DIGITAL 2100 SERVER

DIGITAL EQUIPMENT CORP.
MAYNARD, MASS. (508) 493-5111

The total score is a weighted average based on the importance of each category to users. Ratings are based on user expectations on a 1-to-5 scale, where 1 is below expectations and 5 is above expectations. Categories are presented in order of importance to users.

3.9	[illegible]

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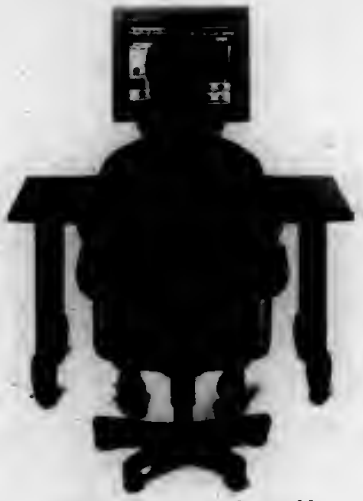

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intel inside

HP NetServer LM • 90- and 66-MHz Intel Pentium™ processor, 66-MHz Intel486™ DX2 processor • Dual Intel Pentium 66-MHz Symmetric Multiprocessing (SMP) • Optional internal hot swap disk array (RAID 0, 1, 5, 6) and ECC memory • HP NetServer Assistant 2.0 included • 16-MB RAM standard, 384-MB maximum • Up to 256-KB write-back cache • 9 mass storage shelves • 8 EISA bus-master I/O slots • Integrated EISA Fast SCSI-2, IDE and video controllers • Designed-in security, serviceability, and cooling features • Tested and certified on all major network operating systems

HP NetServer LF • 66-MHz Intel Pentium processor, 100-MHz IntelDX4 processor, 66-MHz Intel486 DX2 processor • Automatic Server Restart • HP NetServer Assistant 2.0 included • Optional internal hot swap disk array (RAID 0, 1, 5, 6) • 8-MB and 16-MB RAM standard, 192-MB maximum • 256-KB write-back cache • 9 mass storage shelves • 2 PCI, 7 EISA bus-master I/O slots • Integrated EISA Fast SCSI-2, IDE and video controllers • Designed-in security, serviceability, and cooling features • Tested and certified on all major network operating systems

HP NetServer LC • 66-MHz Intel Pentium processor, 100-MHz IntelDX4 processor, 66-MHz Intel486 DX2 processor • Automatic Server Restart • 8-MB and 16-MB RAM standard, 192-MB maximum • Up to 256-KB write-back cache • 1 PCI, 1 PCI/EISA-combo, 4 EISA I/O slots • 5 mass storage shelves • Integrated EISA Fast SCSI-2, IDE and video controllers • Designed-in security, serviceability, and cooling features • Tested and certified on all major network operating systems

Management Solutions: HP Remote Assistant • $999* for intelligent EISA card and software • Complete remote control of server • Continual environmental and server hardware monitoring and error logging • Automatic Server Restart • Works on all major network management environments **HP NetServer Assistant 2.0** • Included with HP NetServer LM and LF, $495* option for HP NetServer LC • A customizable server management software tool set • Proactive system/component alerting and status information • Includes HP OpenView 7.1 • Comprehensive troubleshooting tools

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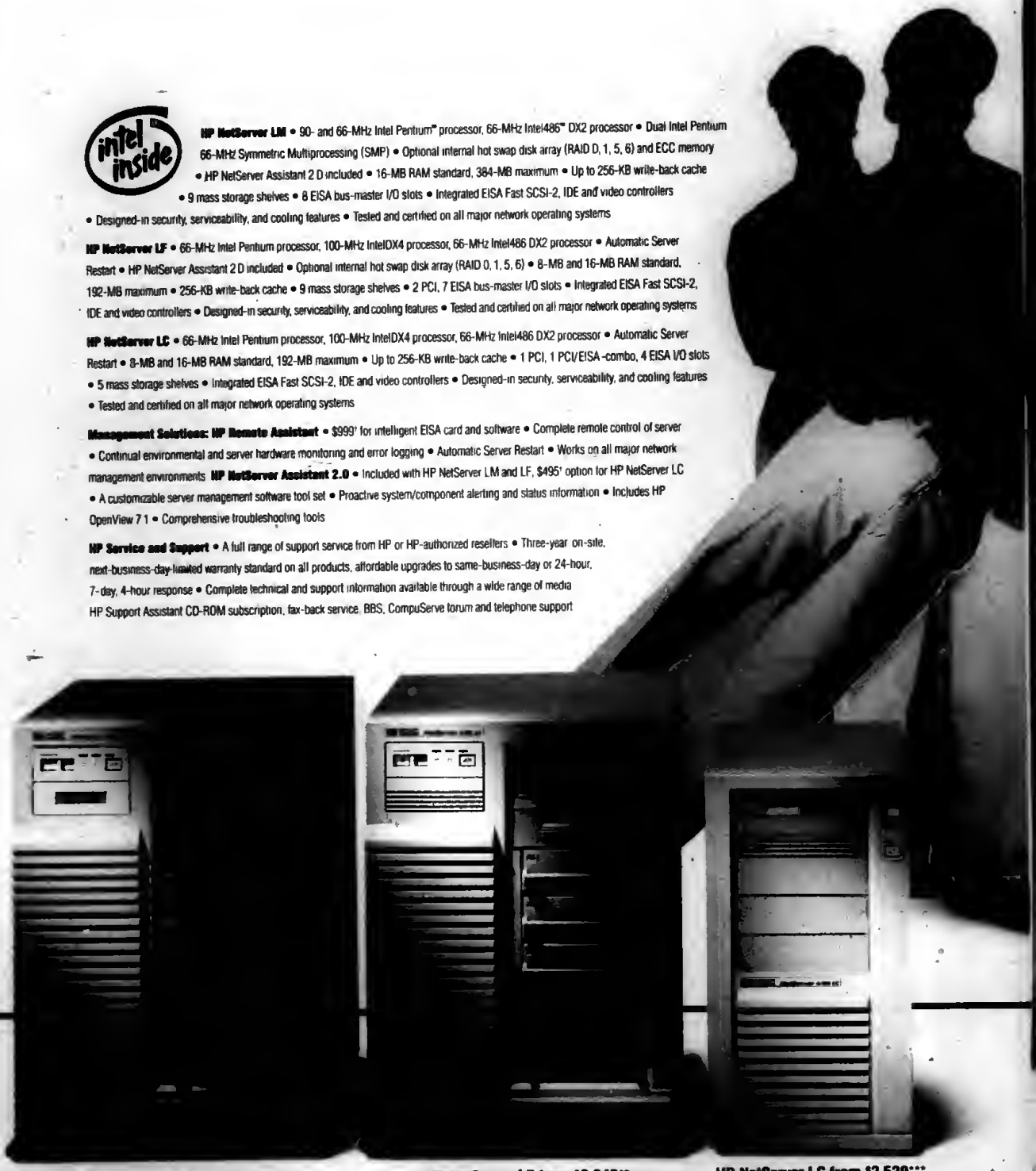

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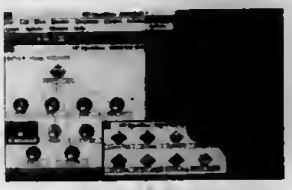

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CAN PROGRAMMERS

AT ISSUE

Should programmers be certified to practice? Proponents say yes. Certification and and sometimes lifesaving functions. Opponents argue that licensing will only saddle of computer and information sciences, who believes licensing is necessary,

"Like doctors, they should adhere to an established code of ethics, a published set of standards."

In the early days of computing, mainframes performed only the most rontine tasks. They crunched numbers, sorted names, printed reports and sometimes even printed checks. When things went wrong, you diagnosed the problem, devised the fix and reran the reports. The most it cost was the sleep you lost during that all-night stint in the computer room — and the grief the users gave you.

The days of simple information processing are over. Today, the software we develop runs multi-billion-dollar corporations, builds cars and controls the temperature inside the incubators of premature infants. In short, it plays a critical role in everyday life. As a result, the development of software has become a business to which the public increasingly entrusts its care. This requires a heightened sense of accountability, responsibility and knowledge.

I believe the licensing of computing professionals is one way to achieve that. Don't get me wrong: I'm not going to argue that licensing is a cure-all. It's not. It is, however, a way to ensure that software developers follow the highest standards of the profession and practice a code of ethics. The right model of licensing, applied well, can ameliorate some of the accountability concerns.

Objection handling

Before mapping out the model I devised, I would like to handle some of the more common objections.

- Programming is an art and is therefore entitled to the protection of free speech. I disagree. Yes, "freedom of speech" will be limited by licensing, but introducing discipline into the development and testing of software is a good thing. It increases the likelihood of discovering a bug in the software designed to control the temperature in the incubator. That could save lives. Developing such software is not an act of free speech.
- Licensing is a gimmick designed to raise money. I disagree. Even if the process does raise revenue, should we eliminate, say, the licensing of electricians or doctors? I say no.
- You can't license a practice that has no mature final standards of practice. I disagree. The science of software is admittedly not a complete or static body of knowledge. By the same token, my teenage children are not yet fully mature. Even though they don't know all the right answers, I expect them to be responsible for the things they do know and to do the best they can do. The same applies to software development.
- Licensing does not guarantee that competence will be applied. This statement is correct. But it focuses on the wrong side of the question. Without licensing, we have no way to ensure that developers have knowledge of current best practices. With licensing, there is strong pressure to ensure that best practices are followed, even in the face of inadequate hud-

Gotternbarn, *page 110*

Gotternbarn is coordinator for the software engineering concentration of the department of Computer and Information Sciences at East Tennessee State University in Johnson City, Tenn. Prior to that, he was a computer consultant who designed software for both corporations and government agencies.

COMMIT MALPRACTICE?

licensing will ensure quality standards, now essential for applications designed to carry out critical the profession with high fees and cumbersome bureaucracy. Taking sides in the debate: a professor and the president of an association of corporate IS professionals, who argues that it's not.

The way I see it, the less government interference, the better. The Social Security bureaucracy is no model of efficiency. The Postal Service isn't exactly an example of good customer service. So, for certain, the government should stay away from the computing profession.

In my experience, there's no evidence that software development professionals should be licensed to practice. The frequently cited examples — of planes crashing and babies dying due to software error — are hypothetical at best. At worst, they are serious problems left to management's discretion and subject to the laws of liability.

In any case, I don't know of a single example where life was lost as a direct result of software error. It's clear to me that the industry isn't crying out for regulation.

Nonexistent problem

That's not to say that problem programmers don't exist; they do. But in my mind, licensing is overkill — a solution to a problem that doesn't exist. Worse still, how could a certification process address complex liability issues, which are better left to the courts to work out? It couldn't.

Furthermore, the marketplace for programmers is highly competitive and becoming more so all the time. That means it regulates itself. As we all know, less skilled programmers, or those who haven't kept up with current programming practices and languages, won't get jobs. It's as simple as that.

Why licensing won't work

There are countless other reasons why licensing is a bad idea. What follows is a list of the most critical ones.

- Today, everyone is a programmer. If you write a macro in Word for Windows, create a formula in Excel, you're a programmer. That makes the notion of licensed to practice absurd. Virtually all PC users, at some time or other, "write" some portion of the software they are using. That means the line between system developer and system user is no longer clear. In the future, it will become even muddier.
- Can you imagine the licensing exam? The test would have to be so general as to be useless. Designing a test that could accurately discern who is certified to develop applications and who is not is impossibly cumbersome. Would it analyze competency in every programming language — in every development methodology?

It's inconceivable that could work. As it stands now, each shop looks for programmers proficient in the skills it needs. If you don't have the skill set your potential employer wants, you won't get the job. That's how the marketplace works and that's the way it should remain.

- Licensing is an expensive, time-consuming process. Who will pay the license fee? Who will finance the training required to pass the test? What will happen to em-

Webber, *page 110*

James B. Webber is president of Omicron, The Center for Information Technology Management in Mountain Lakes, N.J. The group is a national consortium of major computer-using companies

"The marketplace regulates itself for programmers. That's how business works."

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CONTINUED FROM PAGE 106

gets and time constraints.

To avoid these objections, I propose the development of a national standard supported and developed by computing professionals and implemented by state governments. This model is based on the professional engineers' and paramedics' licensing standards. I believe it will work well for software professionals and meet most of the objections raised above. It should include the following points:

- A commitment to a body of knowledge. A four-year degree will ensure that programmers come in contact with current best practices.
- A commitment to reeducation. The license expires every five years. A practioner must prove competence in new practices related to his area of specialization. The standard does not specify how the practitioner should acquire new knowledge, but it does inform him of new areas to be covered. Licensing requires practitioners to keep up with technology.
- The skill content will be determined by computer practitioners. The Computer Society of the Institute of Electrical and Electronics Engineers, Inc. and Association for Computing Machinery (ACM) have already done this for undergraduate computer science education. The standard will establish different levels of licensing based on skills and areas of competence. Programmers should only undertake tasks they are deemed competent to complete. This is consistent with the ACM code of ethics.
- Practitioners must be judged competent to apply the knowledge they have gained. They must work for three years with a licensed computer professional. This apprenticeship requirement is similar to the one for certified public accountants.
- Commitment to follow the standards. That means sanctions for violating best practices and the code of ethics. This measure introduces a counter pressure against outside pressures that could result in the development of shoddy products.

The licensing of computing professionals, as outlined here, will assure the public that systems developers know the best and safest way to do their jobs. Admittedly, there's no assurance that programmers will not engage in malicious or fraudulent activity, but like doctors, they should adhere to an established code of ethics. Without licensing, there are no requirements for heightened care and no concept of professional malpractice. Licensing, while not a cure-all, makes it more likely that programmers have knowledge of the best practices in their field. Most of all, it instates pressure to do the right thing. ■

CONTINUED FROM PAGE 107

ployed programmers who fail the exam? Most likely, those responsibilities and decisions will fall to the corporations or government agencies that employ programmers.

This will cause some companies to relocate to states without licensing laws, leaving thousands of people out of work. And it will cost programming shops precious time that could be spent developing applications that add business value by making money for the corporations they work for. In short, licensing could cause a disaster of major proportion for IS shops.

- We don't need another government agency. Creating one to administer testing and licensing will cost taxpayers money without providing a corresponding benefit. That's probably illegal. It will also add layers of bureaucracy we don't need. We already have too many government agencies. What's more, I have yet to see one that can tackle a problem better than private industry can.

To sum it up, the licensing of computer professionals is a costly, unnecessary undertaking that will create more problems than it solves. No one stands to benefit, except those who have a vested interest — those who will make money from the passage of such a bill. ■

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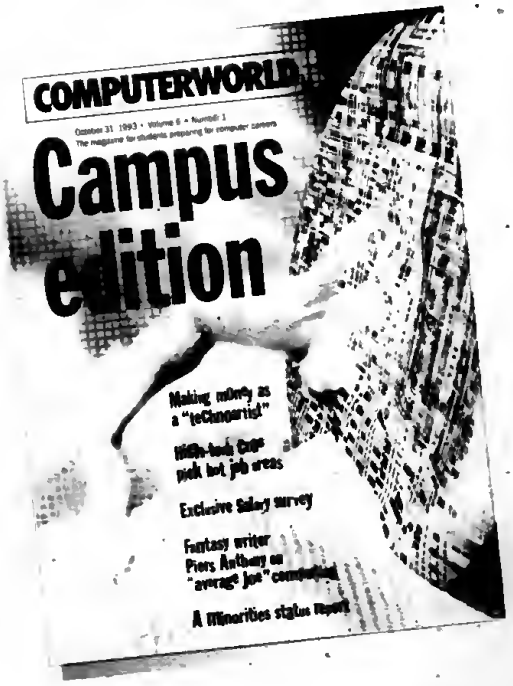

Issue Date: October 31, 1994
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Planned Editorial Features:
(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Information Systems salaries from Computerworld's annual survey with the Association for Systems Management
- And much more!

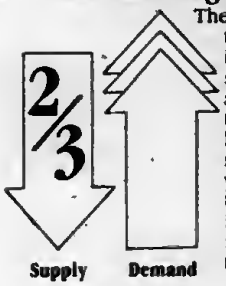
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

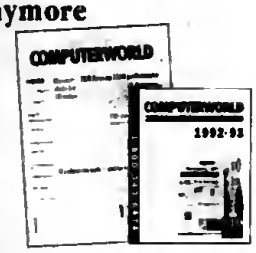
What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better - and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore



That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

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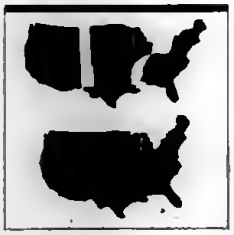

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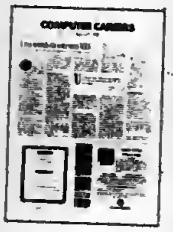

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TOP JOBS

A COMPUTERWORLD SURVEY REVEALS THE MOST COVETED POSITIONS IN INFORMATION SYSTEMS. MOST RESPONDENTS LIKE THEIR OWN JOB, BUT RANKED MANAGEMENT THE BEST OVERALL.

By Julie Hart

"I've been in data processing since 1956," says Terry Loring, a systems analyst at Southern Illinois Power Cooperative in Marion. "I can't imagine working in any other field. I love my job."

For the most part, Loring isn't alone. Respondents to a recent *Computerworld* poll think working in information systems is a great way to make a living. However, opinions vary about who has the best job.

For example, Loring says systems analysts have the most rewards, but some of his peers have their sights set on something different. "I've always envied [managers]," says Bill York, a systems analyst for Orange County in Orange, Calif. "If you have a good staff, I think it would be fun."

Of course, York has reservations about the stress level that comes with the job. "I've worked for a lot of people in the past 20 years or so, from the best to the worst. If you let stress eat you up, you won't be a good manager," he says.

For some, it doesn't get any better than being a programmer. "I think it would be nice to come in, write some code and then go home," says Ross Robertson, database administrator at Piggly Wiggly Corp. in Charleston, S.C. According to Robertson, being a database administrator is demanding, making it hard to leave at the end of the day. "Programmers can shut off their computers and call it a day without much worry."

Moreover, the independence afforded is key. "Often, it's just me and my machine," says Ken Robison, a programmer for the city of Kansas City in Missouri. "My deadlines are reasonable because I usually set the schedule. I have a sense of independence that I don't think can be found [in other IS positions]."

Programming perks

Stagnant or not, not everyone wants this job. "No way," says Carol Gompper, a systems administrator at U.S. Filter/Continental Water Systems in San Antonio. "I think it would be a hair-raising job with a lot of stress. If I couldn't get the code to work the way I wanted, I'd go nuts."

Instead, Gompper says she would trade in her administration hat to be a systems analyst. "There are lots of problems to solve, but at least they're solvable," she says. Further down the road, Gompper says, she sees herself in an IS director's role. "I'd much rather answer to one big boss than to dozens of demanding end users."

On the other hand, some systems administrators wouldn't trade their jobs for the world. They attribute their love for their jobs to the fact that, in many cases, their companies couldn't get along without them. "No matter what, my company needs me to keep our system up and running," says Dale von Wolffradt, systems administrator at Pacific Clay Products, Inc. in Corona, Calif.

Network love

The most adamant, perhaps, are people who handle network administration. Similar to other administrators, network specialists feel they keep users productive. And even though the responsibility can be overwhelming at times, the rewards are apparently worth it.

"In a fast-moving company, the network administrator isn't just a nuts-and-bolts person that gets stuck," says Jim Lindley, information and administrative manager at Mack & Parker, Inc. in Chicago. "You have a chance to interact with upper management, and you get to provide exciting new technology to users. For the most part, everyone values your opinion on direction and technology." Down the road, Lindley says, there's even a good chance to move into management.

Aside from that, network administration offers plenty of challenge and variety. "You don't know what's going to happen from minute to minute," says Nancy Manley, a network manager at the Maryland Department of Environment in Baltimore. "You're working with everything from PCs to routers, trying to manage everything in between. It's an exciting position that keeps me going."

Hart is a free-lance writer in Sunnyvale, Calif.

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WANS

A PRIMER FOR THE UNINITIATED

By Paul Karon

In his various capacities as a computer and telecommunications specialist, Phil Evans has implemented several wide-area networks. "I've got the gray hair to prove it," he says. "And the scars, too."

Of course, Evans is half joking about the aging process that accompanies wide-area networking. On the other hand, he is half serious.

As director of telecommunications planning at Perot Systems Corp. in Dallas, Evans has finally attained an almost "Yoda-like" philosophy toward what may be one of the most slippery areas of information systems planning. "Some companies see telecommunications as a necessary evil to be minimized," Evans says. "Others see it as a strategic tool to be optimized."

Regardless of the opinion, wide-area networking is a good area to be in. "The great thing about networking is that it's dynamic. You can design and test, and by the time you install, the whole market has changed," Evans says.

If you don't have a WAN yet, you need to be familiar with a number of new areas to plan a successful system. For example, you'll eventually have to choose a protocol, select long-distance and local-loop carriers and determine whether to purchase dedicated point-to-point connections or lease switched services on public networks.

"Ultimately, it's a matter of determining the business question of what needs to be done," says Michael Chacon, senior network consultant at Inacom Information Systems in Omaha. For example, you must decide if the WAN will carry basic computer data or if it will be the foundation for more ambitious multimedia applications.

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Once you determine the applications and the hardware, you can begin exploring the bandwidth and transmission protocols. For example, a Unix-based network or a system that needs access to the Internet requires TCP/IP. A pure Novell, Inc. network, meanwhile, needs the NetWare IPX/SPX protocol.

Then there's the kind of applications. For full-blown multimedia capability, you'll need at least T1 or DS1 line speeds with the prospect of moving to DS3 line speeds of 45M bit/sec., Evans says. But if the information flowing on the WAN is data-only, you have the option of going with lower-bandwidth, less-expensive 56K bit/sec. channels.

Use what you need

Again, the best course of action is determined by use. If you're going to run high quantities of data through the WAN all day, a dedicated T1 line may be the best solution. But if you're going to use it heavily for only a few hours each day, a switched line may be adequate. There is also the possibility of combining the two services, Evans says.

Costs also need to be considered. For example, a T1 line from San Francisco to Washington costs about $15,000 per month, according to Bob Harbison, president of Network Integration Consultants in Sausalito, Calif. Along the way, you'll also have to determine which long-distance carrier will provide the best backbone services.

As for selecting a topology, it depends on the business in question. In other words, how much is it worth to have near-perfect reliability or can the company tolerate downtime? "It becomes a balance of reliability against cost," Evans says.

Although setting up a WAN is likely to be more complicated than a LAN, it can provide intrepid IS managers with a new set of options to mesh IS more closely with the company's business. "A network designer and manager has a lot of options to dynamically allocate what information is flowing over their fixed capacity network," Evans says. ■

Karon is a free-lance writer in Los Angeles.

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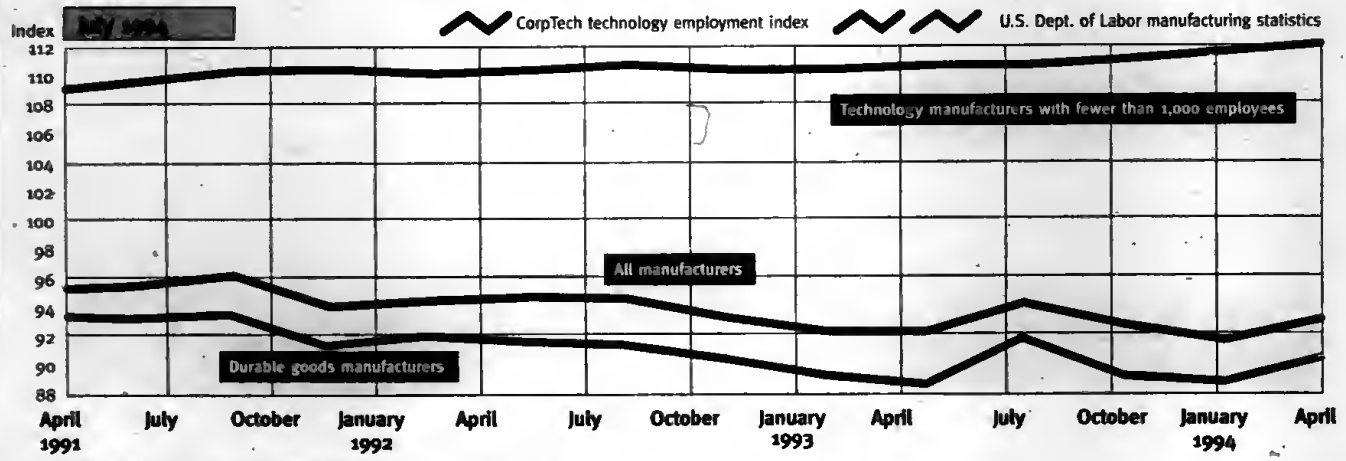

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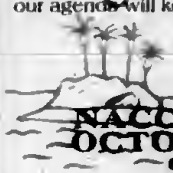

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"To generate sales for Across the Boards, a communications toolkit for developing cooperative applications, and pcMAINFRAME, a generalized micro-to-mainframe file transfer system, cfSOFTWARE has been advertising in *Computerworld Direct Response Cards* almost from the very start. Now, based on our past success, we've also started to advertise pc2POWER, our newest file transfer system. Since all of our products facilitate mainframe-to-micro communication, we need to reach IS managers and technical support professionals on the mainframe side as well as end users on the PC side. That's why *Computerworld Direct Response Cards*, with their large audience of buyers most apt to need our products, are one of our primary advertising vehicles.

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by julie hart

Once you decide to move to a oew hardware platform, it's time to get out your spreadsheets and residual forecasts. Vendors can set up migration strategies for their customers, but residual values are invaluable for deciding when to make the move.

"Residual values are more important than people realize," says Tony Membrino, a research analyst at International Data Corp. in Framingham, Mass. "They're helpful in understanding expected life cycles and product acceptance."

Once you know how well a system will retain its value, you can decide whether to buy new or used equipment, lease or purchase equipment, wait for new technology or dump a system before it reaches zero value.

Coosider what's happening in the IBM, Hewlett-Packard Co. and Digital Equipment Corp. arenas.

The value of IBM's AS/400 F50, for example, is expected to drop significantly between 1995 and 1996. For companies already planning to move to the IBM AS/400 310, it's time for them to decide whether to get rid of the F50 today, Membrino says.

Or if a model's value is dropping quickly, it may make sense to wait for the veodor's next generatioo of hardware before migrating. "When IBM announces RISC in 1995, I assume there will be enough migratioo to push down the valoe of the [IBM AS/400] 310 and older AS/400 modeis," Membrino says.

As a result, holding off on purchasing the 310 may be in order, at least until RISC's implications are more clear.

Timing is especially tricky in the HP arena. HP has a clear path for customers to move to opeo systems, yet the 3000 market — especially the low end — is under pressure from competition, including its own 9000 products.

"[HP] has consistently cut prices and introduced new, faster products at lower price points," Membrino says. So companies wanting the highest resale value for their hardware should expect to upgrade more often.

Digital hopes to increase the presence of its Alpha series by focusing on high-volume sales. As a result, users can expect to find more DEC 7000 series machines in the $120,000 to $200,000 range, Membrino says. Digital's 2100 line is also expected to have exceptional price/performance levels. ■

Hart is a free-lance writer in Sunnyvale, Calif.

Residual forecast:

There's a good time and a bad time to buy and sell equipment. If you've decided to migrate to a new platform, use the charts below to find out how well and how long your system will hold its value.

	List price		Jan. 1995	Jan. 1996	Jan. 1997
			(percentage of list price)		
IBM AS 400 F50	$155,000[1]	Retail	41%	12%	2%
IBM AS 400 310 2043	$118,500[2]	Retail	New*	46%	20%
Digital VAX 4000-500A	$57,800[3]	Retail	New*	27%	6%
Digital VAX 7000-610	$215,000[4]	Retail	28%	12%	3%
HP 3000 968LX	$112,700[5]	Retail	New*	63%	33%
HP 3000 995 100CX	$385,000[6]	Retail	New*	40%	15%
			July 1995	July 1996	July 1997
IBM RS 6000 PowerServer 970	$94,500[7]	Retail	26%	12%	6%
IBM RS 6000 PowerStation 730	$48,275[8]	Retail	15%	7%	3%
			Jan. 1995	Jan. 1996	Jan. 1997
Digital Alpha 2100-A500MP	$26,900[9]	Retail	New*	New*	25%
HP 9000 712 80I	$6,140[10]	Retail	New*	43%	21%
HP 9000-170	$105,500[11]	Retail	61%	41%	24%

Source: International Data Corp., Framingham, Mass.

1 Price includes 64M bytes of main memory, 20-byte internal DASD
2 Price includes 64M bytes of main memory, 10-byte internal DASD
3 Price includes 32M bytes of main memory, 20-user OpenVMS license
4 Price includes 128M bytes of main memory, unlimited OpenVMS license
5 Price includes 32M bytes of main memory, 100-user license MPE/iX FOS, Image/SQL and Allbase/SQL, 10-byte disk.
6 Price includes 256M bytes of main memory, 100-user license MPE/iX FOS, Image/SQL and Allbase/SQL.
7 Price includes 64M bytes of main memory
8 Price includes 16M bytes of main memory
9 Price includes 64M bytes of main memory, 20-byte internal DASD, base license, open AIX/VMS
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11 Price includes 64M bytes of ECC memory, 20-byte DASD

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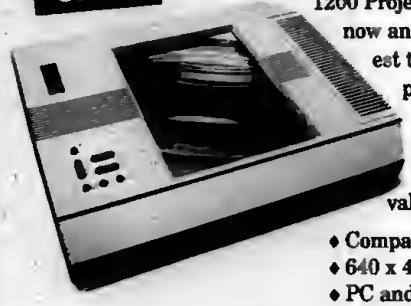

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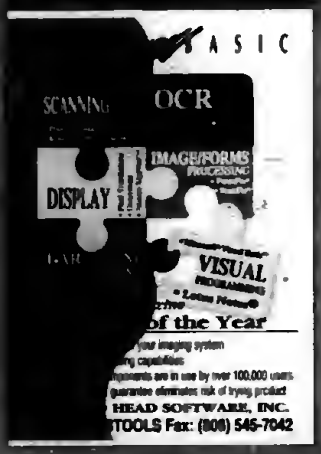

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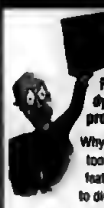

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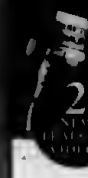

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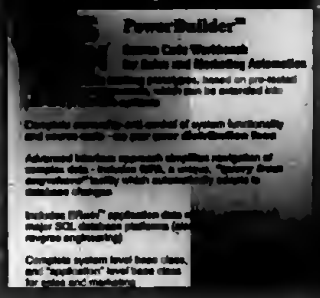

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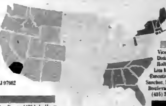

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Walker Interactive Systems	23.3	American Software Inc.	-12.2
Magic Software Enterprises	20.6	Cognitronics Corp.	-9.1
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Cray Computer	18.4	Microage Inc.	-8.6
Telebit Corp.	17.9	Centigram Communications	-8.5
Network General	17.2	System Software Assoc.	-8.3

Dollar

Gainers		Losers	
3COM Corp.	5.63	Corel Corp.	-2.75
ParcPlace Systems Inc.	4.50	Cirrus Logic	-1.63
Autodesk Inc.	4.47	BellSouth Corp.	-1.63
Intuit Inc.	4.38	System Software Assoc.	-1.25
US Robotics	4.00	Xyplex Inc.	-1.25
Stratacom Inc. (H)	4.00	Powersoft	-1.25
Compuware Corp.	3.88	Centigram Communications	-1.25
Chipcom Corp	3.75	BMC Software Inc.	-1.13

[redacted]

Market shows promise

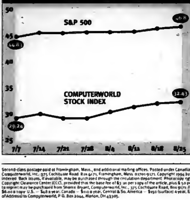
If you are looking for a good investment, keep an eye on contract electronic manufacturers (CEM). Although the industry is young, electronics manufacturers are increasingly outsourcing the design and production of assembled printed circuit boards. CEMs with the most satisfied customers will do best, said Pamela Gordon, president of Technology Forecasters in Berkeley, Calif. "This is a service industry," she said. "It's the customers who will determine the leaders."

Investors should also watch CEMs such as **Dovatron International, Inc. (DOVT)**, which look ready to expand geographically.

"It opens up opportunities for CEMs to do more testing and shipping to the user," Gordon said. A U.S. OEM, for example, might use an overseas CEM to manufacture and distribute products locally rather than incur the cost of doing those things from home, she said.

In a recent report, analyst John Dean at Salomon Brothers, Inc. in San Francisco rated Dovatron a Buy because it is poised for that kind of growth. "We see the company as having room to expand its existing facilities, particularly in Colorado, Southern California, Mexico and Malaysia," he reported.

One caveat CEMs face is the size of the industry. With several hundred in the U.S. alone, smaller CEMs could have a harder time turning a substantial profit. "The average industry profit is very low," Gordon said. "But the globalization of the electronics industry should provide some great opportunities for the right companies." —*Erin Callaway*



Communications and Network Services

Exch	52-Week Range			Aug. 26 3 pm	Wk Net Change	Wk Pct Change
OTC	65.13	24.13	3COM Corp	65.13	5.63	9.5
NYS	45.50	36.25	Ameritech Corp	41.63	0.13	0.3
NYS	63.38	49.50	AT&T	54.88	1.63	3.1
OTC	26.50	12.75	Banyan Systems Inc.	14.00	-0.25	-4.5
NYS	69.13	49.00	Bell Atlantic Corp	54.88	-0.63	-1.1
NYS	63.88	53.00	BellSouth Corp	59.25	1.63	-2.7
NYS	21.50	8.38	Bolt, Beranek & Newman	16.00	1.88	13.3
OTC	15.75	9.00	Brooktrout Technology	10.50	0.00	0.0
NYS	132.50	82.63	Cabletron Systems	105.75	1.13	1.1
OTC	43.00	18.00	Centigram Communications	13.50	-2.25	-8.5
OTC	80.25	31.50	Chipcom Corp	53.75	1.25	7.5
OTC	40.75	18.75	Cisco Systems Inc	25.25	2.38	10.4
OTC	18.38	9.25	Compression Labs Inc	17.13	-0.50	-4.3
OTC	12.38	5.13	Computer Network Tech	6.61	-0.02	-0.2
OTC	33.75	0.50	CrossComm	0.50	-0.50	-5.0
OTC	3.00	2.50	Data Switch Corp.	2.38	0.00	0.0
OTC	36.50	17.00	DSC Communications	27.02	2.14	8.6
NYS	19.50	8.25	General Datacomm Inds. (H)	19.50	0.38	2.0
NYS	39.88	29.50	GTE Corp	32.00	0.63	2.0
NYS	95.67	78.63	ITT Corp	86.13	2.25	3.3
OTC	29.63	21.38	MCI Communications Corp	24.13	1.38	0.0
OTC	7.75	1.88	Microcom Inc.	7.75	0.63	8.8
OTC	23.50	11.25	NetManage Inc.	18.50	1.23	6.5
OTC	7.25	4.00	Netrix Corp	4.25	0.25	6.3
OTC	8.75	3.50	Network Computing Devices	3.75	0.00	0.0
NYS	23.00	7.38	Network Equipment Tech. (H)	12.25	0.75	6.5
OTC	23.38	11.50	Network General	19.63	2.88	17.2
OTC	9.63	6.38	Network Systems Corp	9.00	0.00	0.0
OTC	71.25	28.50	Newbridge Networks Corp	31.50	-0.50	-1.6
NYS	35.75	23.75	Northern Telecom Ltd (H)	35.75	1.13	3.2
OTC	26.63	13.38	Novell Inc.	15.50	0.25	1.6
NYS	48.88	33.25	Nynex Corp	38.13	-0.50	-1.3
OTC	30.00	15.50	Octel Communications Corp.	22.80	1.25	5.9
OTC	18.25	9.00	Optical Data Systems Inc	16.25	0.00	0.0
OTC	7.50	3.13	Penril Data Comm Networks	4.00	0.50	14.1
OTC	20.75	10.00	PictureTel Corp.	15.13	-0.13	-0.8
OTC	8.25	2.13	Proteon Inc.	3.38	0.25	8.0
OTC	14.38	2.75	Racotek Inc.	4.00	-0.13	-3.0
NYS	44.11	24.88	Scientific Atlanta Inc (H)	44.13	1.63	3.8
NYS	47.00	36.75	Southwestern Bell Corp.	47.25	-0.13	-0.3
NYS	60.75	31.38	Sprint Corp.	38.75	0.63	1.6
OTC	28.25	15.38	Standard Microsystems Corp.	18.25	0.88	5.0
OTC	41.00	11.50	StrataCom Inc. (H)	41.00	4.00	10.8
OTC	31.75	13.13	Synoptics Communications	16.00	1.00	6.7
OTC	15.75	3.88	Telebit Corp.	5.25	0.88	17.9
OTC	46.00	23.00	US Robotics	34.75	4.00	13.0
NYS	50.75	38.25	US West Inc	40.13	0.00	0.0
OTC	43.88	18.75	Wellfleet Communications	23.13	1.25	5.7
OTC	28.75	12.75	Xircom	18.75	1.25	9.7
OTC	25.00	13.25	Xylogics Inc.	22.00	2.50	12.8
OTC	29.50	11.25	Xyplex Inc.	17.25	-1.25	-6.8

PCs and Workstations

Exch	52-Week Range			Aug. 26 3 pm	Wk Net Change	Wk Pct Change
OTC	7.50	2.63	Advanced Logic Research	4.25	0.00	0.0
OTC	38.50	22.00	Apple Computer Inc	35.63	1.13	3.3
OTC	33.00	12.50	AST Research Inc.	17.00	0.00	0.0
NYS	39.88	17.59	Compaq Computer Corp.	38.88	1.88	5.1
OTC	38.25	15.13	Dell Computer Corp (H)	34.63	0.75	2.2
OTC	25.00	8.25	Gateway 2000 Inc	15.00	0.00	0.0
NYS	93.61	60.38	Hewlett Packard Co.	89.13	1.88	2.1
NYS	26.88	10.00	Silicon Graphics	25.13	-0.13	-0.5
OTC	31.38	18.25	Sun Microsystems Inc.	27.13	1.13	4.3
NYS	50.75	29.50	Tandy Corp	40.25	0.38	0.9
OTC	5.13	2.38	Zeos International Ltd.	3.31	-0.31	-8.6

Large Systems

Exch	52-Week Range			Aug. 26 3 pm	Wk Net Change	Wk Pct Change
ASE	7.88	4.38	Amdahl Corp	7.75	0.75	10.7
NYS	7.63	3.13	Convex Computer	7.00	0.63	9.8
OTC	4.50	0.50	Cray Computer	1.81	0.28	18.4
NYS	33.75	19.13	Cray Research Inc	20.88	-0.25	-1.2
NYS	10.75	6.63	Data General Corp	8.38	0.38	4.7
NYS	43.13	18.25	Digital Equipment Corp	24.75	2.25	10.0
OTC	6.38	2.38	Encore Computer Corp	4.13	0.25	6.2
NYS	52.75	39.63	Harris Corp.	48.00	2.13	2.4
NYS	69.25	41.25	IBM (H)	69.75	1.88	2.8
OTC	18.75	7.75	NetFrame	10.88	0.75	8.1
OTC	26.00	3.88	Parallan Computer	4.38	0.13	2.9
OTC	22.50	5.38	Pyramid Technology	8.69	0.69	8.6
OTC	20.00	11.13	Sequent Computer Sys	16.50	-0.25	-1.5
OTC	6.84	2.19	Sequoia Systems Inc.	5.38	0.50	10.3
NYS	38.63	22.88	Stratus Computer Inc. (H)	37.88	-0.13	-0.3
NYS	16.38	8.75	Tandem Computers Inc.	15.38	0.75	1.7
OTC	30.00	3.88	TriCord Systems	5.88	0.25	4.4
NYS	16.50	8.63	Unisys Corp.	10.13	0.38	3.8

Software

Exch	52-Week Range			Aug. 26 3 pm	Wk Net Change	Wk Pct Change
OTC	34.50	16.25	Adobe Systems Inc.	31.54	-0.61	-2.5
OTC	34.50	16.25	Aldus Corp	31.38	-0.50	-3.6
OTC	8.38	4.38	American Software Inc.	4.50	-0.63	-12.2
OTC	15.75	8.75	Ask Computer Systems	13.00	0.00	0.0
OTC	62.59	37.00	Autodesk Inc.	62.59	4.47	7.7
OTC	4.25	1.75	Bachman Info Systems	2.38	0.00	0.0
OTC	31.00	20.50	BGS Systems Inc.	23.25	-1.00	-4.1
OTC	71.00	40.50	BMC Software Inc.	49.50	-1.13	-2.2
OTC	30.75	22.50	Boole & Babbage	28.50	0.75	2.7
OTC	19.00	8.68	Borland Int'l. Inc.	13.63	-0.25	-1.8
OTC	25.00	6.75	Brock Control Systems Inc.	10.13	-0.13	-1.2
OTC	6.63	2.38	CE Software	2.75	-0.19	-6.4
ASE	30.34	6.25	Cheyenne Software Inc.	12.63	1.75	16.1
OTC	14.25	7.38	Cognos Inc	10.25	-0.19	-1.7
NYS	44.88	27.38	Computer Associates	40.25	0.50	1.3
NYS	5.38	2.13	Computervision Corp	2.25	0.00	0.0
OTC	48.25	21.00	Compuware Corp.	42.50	3.88	10.0
OTC	14.00	7.50	Comshare Inc	9.25	0.00	0.0
OTC	25.00	13.50	Corel Corp	16.63	-2.75	-14.2
OTC	7.13	3.00	Easel Corp	4.00	-0.13	-3.0
OTC	29.25	13.00	FileNet Corp	22.00	1.25	6.0
OTC	25.00	3.00	4th Dimension	6.75	-0.25	-3.6
OTC	13.75	7.25	Frame Technology	13.25	1.50	12.8
OTC	12.00	7.00	Group 1 Software	8.00	0.00	0.0
OTC	31.75	6.75	Gupta	9.75	-0.88	-8.2
OTC	12.00	5.88	Hogan Systems Inc.	8.00	0.50	6.7
OTC	29.50	16.00	IMRS	29.13	1.88	6.9
OTC	44.75	13.50	Information Resources	14.00	0.50	3.7
OTC	24.50	14.25	Informix Corp.	23.50	2.75	13.3
OTC	12.38	8.75	Intergraph Corp.	9.38	-0.38	-3.8
OTC	8.75	2.50	Interleaf Inc.	3.38	0.00	0.0
OTC	15.50	7.75	Intersolv Inc.	12.88	-0.38	-2.8
OTC	50.00	27.00	Intuit Inc	44.63	4.38	10.0
OTC	18.25	2.25	KnowledgeWare Inc.	7.38	-0.25	-3.3
OTC	34.75	27.50	Legent Corp	32.13	0.63	2.0
OTC	86.50	29.75	Lotus Development	43.75	1.75	4.2
OTC	18.00	6.38	Magic Software Enterprises	10.75	1.75	20.6
OTC	16.50	4.00	Manugistics Group Inc	9.00	0.50	5.9
OTC	7.50	1.44	MathSoft	2.00	-0.13	-5.0
OTC	11.25	4.50	McAfee Associates	9.00	0.25	2.8
OTC	17.25	9.25	Mentor Graphics	10.38	-0.38	-3.5
OTC	30.75	31.50	Micro Focus	11.25	-0.88	-3.6
OTC	11.63	4.63	Micrografx Inc.	5.88	-0.13	-2.1
OTC	56.88	35.88	Microsoft Corp (H)	56.88	1.94	3.5
OTC	41.61	23.81	Oracle Corp (H)	41.63	2.88	7.3
OTC	44.75	21.50	Parametric Technology	28.50	0.75	2.7
OTC	34.50	13.38	ParcPlace Systems Inc.	23.25	4.50	24.0
OTC	46.25	26.00	PeopleSoft (H)	46.75	2.38	5.4
OTC	6.25	3.50	Phoenix Technologies	5.13	0.13	2.5
OTC	69.50	24.25	Powersoft	42.25	-1.25	-2.9
OTC	39.75	3.50	Platinum Software	6.50	0.00	0.0
OTC	17.13	7.25	Platinum Technology (H)	16.13	0.25	1.5
OTC	40.25	27.00	Progress Software Corp	33.25	-1.00	-2.9
OTC	4.13	1.94	Quarterdeck Office Sys	2.44	0.00	0.0
OTC	28.25	8.50	Rainbow Technologies Inc	11.63	-0.13	-1.1
OTC	11.38	3.38	RasterOps	4.13	-0.13	-2.9
OTC	14.50	2.88	Ross Systems	4.38	-0.13	-2.8
OTC	28.75	2.75	Sapiens Intl. Corp N.V. (L)	3.13	0.00	0.0
OTC	14.62	0.75	Softkey International Inc.	12.75	0.13	1.0
OTC	8.63	3.00	Software Publishing Corp	3.75	0.00	0.0
OTC	13.75	5.00	State of the Art	7.75	0.75	10.7
NYS	35.63	21.75	Sterling Software Inc.	30.25	0.13	0.4
OTC	20.50	6.88	Struct. Dynamics Research	8.38	0.25	3.1
OTC	57.00	25.75	Sybase Inc.	45.13	1.88	4.1
OTC	20.50	9.00	Symantec Corp	14.00	1.25	9.8
OTC	52.75	33.00	SynOpsys	42.50	1.75	4.3
OTC	18.00	11.75	System Software Assoc.	13.75	-1.25	-8.3
OTC	6.75	3.25	Trinzic Corp	3.50	0.00	0.0
OTC	30.00	13.75	ViewLogic Systems	30.75	0.75	1.4
OTC	21.25	12.00	VMark Software Inc.	20.00	1.50	8.1
OTC	13.25	5.75	Walker Interactive Systems	9.25	1.75	23.3
OTC	60.00	24.75	Wall Data Inc	40.00	1.75	4.6

Semiconductors

Exch	52-Week Range			Aug. 26 3 pm	Wk Net Change	Wk Pct Change
NYS	32.50	16.75	Advanced Micro Devices	29.38	0.63	2.2
NYS	31.63	18.38	Analog Devices Inc. (H)	31.38	0.88	2.9
OTC	29.88	10.94	Atmel Corp	29.88	2.44	8.9
OTC	7.50	3.63	Chips and Technologies	6.25	0.13	2.0
OTC	48.63	23.88	Cirrus Logic	29.00	-1.63	-5.3
NYS	20.00	11.25	Cypress Semiconductor Corp (H)	19.75	0.75	3.9
NYS	20.13	13.00	Dallas Semiconductor	15.88	-0.13	-0.8
OTC	27.75	14.75	Integrated Silicon Systems	24.75	2.00	8.8
OTC	74.50	55.88	Intel Corp	64.75	2.38	3.7
NYS	31.25	13.00	LSI Logic Corp (H)	30.75	0.50	1.7
OTC	26.25	12.25	Lattice Semiconductor	18.00	0.00	0.0
NYS	44.75	35.16	Micron Technology (H)	44.00	0.13	0.3
NYS	55.13	42.13	Motorola Inc.	55.13	2.25	4.3
NYS	25.00	14.38	National Semiconductor	19.25	0.50	2.7
OTC	12.13	6.75	Sierra Semiconductor	11.50	-0.13	-1.1
NYS	89.50	55.75	Texas Instruments	82.63	-0.38	-0.5
OTC	18.88	9.38	VLSI Technology	15.00	-0.75	-4.8
OTC	14.38	3.00	Weitek	3.13	-0.25	-7.4
ASE	20.38	4.63	Western Digital Corp.	15.38	-0.50	-3.1
OTC	59.75	29.00	Xilinx	46.50	2.00	4.5
OTC	40.75	20.50	Zilog Inc.	32.75	1.00	3.1

Peripherals and Subsystems

Exch	52-Week Range			Aug. 26 3 pm	Wk Net Change	Wk Pct Change
OTC	30.50	14.50	American Power Conversion	18.75	1.25	6.6
OTC	24.75	17.25	BancTec Inc.	23.90	3.50	0.8
OTC	7.75	3.25	Cambex Corp	4.63	0.25	5.7
ASE	7.38	1.88	Cognitronics Corp	2.50	-0.25	-9.1
NYS	20.50	9.00	Conner Peripherals	12.88	-1.00	-7.7
OTC	24.00	8.75	Creative Technologies Inc.	10.13	0.13	0.7
OTC	14.00	3.50	Data Race Inc.	4.88	1.13	30.0
ASE	10.75	4.13	Dataram Corp	5.63	0.50	9.8
NYS	23.00	12.38	EMC Corp	18.13	2.25	14.2
OTC	8.88	3.13	Emulex Corp	8.88	0.50	6.0
OTC	31.00	11.75	Evans & Sutherland	12.75	0.25	2.0
OTC	23.50	8.25	Exabyte	10.75	0.00	0.0
OTC	14.00	2.63	Intelligent Info. Systems	3.75	0.13	3.4
OTC	6.38	2.00	Iomega Corp	2.50	0.06	2.6
OTC	9.75	3.00	IPL Systems Inc.	3.88	0.25	6.9
OTC	20.50	13.75	Komag Inc	23.50	0.13	0.5
OTC	8.41	4.25	Maxtor Corp	4.75	-0.75	-13.6
OTC	8.75	4.88	Micropolis Corp	6.63	0.00	0.0
OTC	22.50	10.00	Pinnacle Micro Inc.	13.75	2.25	19.6
OTC	18.25	8.25	Printronix Inc	16.75	0.50	3.2
NYS	11.75	6.88	QMS Inc.	10.00	0.63	6.7
OTC	20.25	9.38	Quantum Corp	15.13	-0.88	-5.1
OTC	9.13	3.63	Radius Inc.	4.00	0.06	1.6
NYS	17.75	6.25	Recognition International (L)	7.13	0.13	1.8
OTC	4.88	3.63	Reada Inc.	4.25	-0.38	-7.3
OTC	28.75	10.25	Seagate Technology	25.00	-0.38	-1.5
NYS	41.50	23.75	Storage Technology	36.38	-0.63	-1.7
NYS	31.38	21.38	Tektronix Inc	33.50	0.88	2.0
NYS	107.63	85.88	Xerox Corp.	107.63	0.88	0.8

Services

Exch	52-Week Range			Aug. 26 3 pm	Wk Net Change	Wk Pct Change
OTC	27.25	15.13	American Mgmt. Systems	26.63	-0.13	-0.5
NYS	4.75	2.50	Anacomp Inc	2.88	-0.25	-8.0
OTC	23.50	14.50	Analysts Int'l	15.25	0.75	5.0
NYS	56.88	47.63	Auto Data Processing	54.38	0.75	1.4
OTC	18.25	11.00	Cambridge Tech. Partners	24.75	-0.50	2.3
NYS	27.13	15.00	Ceridian Corp	27.00	1.75	6.8
NYS	24.75	14.25	Comdisco Inc.	21.88	1.63	8.0
OTC	12.50	6.00	Computer Horizons	10.00	0.13	1.3
NYS	65.25	29.38	Computer Sciences	44.13	2.25	5.4
NYS	9.88	6.00	Computer Task Group	9.00	-0.13	-1.3
NYS	32.38	8.75	CompUSA Inc (L)	6.88	-0.25	-3.5
OTC	13.50	6.38	Control Data Systems Inc	7.63	0.88	13.0
OTC	11.00	6.13	Egghead Discount Software	7.63	1.00	16.2
NYS	38.00	26.50	General Motors E (EDS)	36.38	1.50	4.3
OTC	22.25	7.25	Inacom Corp	9.38	0.25	2.6
OTC	28.00	13.63	Intelligent Electronics	15.50	-1.00	-6.1
OTC	22.50	7.00	[illegible]	9.00	-0.63	-6.5
OTC	32.50	9.25	Microage Inc.	12.00	-1.13	-8.6
OTC	40.50	28.50	Paychex	32.75	0.50	1.6
NYS	30.75	22.25	Policy Management Sys.	37.00	2.38	6.9
NYS	26.50	18.63	Reynolds and Reynolds (H)	26.50	1.00	3.9
OTC	28.50	17.00	SEI Corp	21.00	-0.25	-1.2
OTC	29.38	20.88	Shared Medical Systems	24.63	0.13	0.6
OTC	11.00	4.88	SHL Systemhouse (L)	5.00	-0.06	-1.2
OTC	26.50	9.25	Software Spectrum Inc	22.50	-0.25	-1.1
OTC	42.75	31.50	SunGard Data Systems	36.75	0.75	2.1

KEY (H) = New annual high reached in period (L) = New annual low reached in period

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Lotus shifts

CONTINUED FROM PAGE 1

ally on a more timely basis. Desktop product slips and poor international sales led to earnings that disappointed analysts two quarters in a row.

Users contacted last week yawned at the apparent demise of 1-2-3 for DOS and said they thought the shift in emphasis to communications was a good move.

"Organizer and CC:Mail today are far superior to Microsoft's communications products. And Microsoft's suite is far superior on the desktop. I have to guess that Lotus recognized the same thing," said Rick Kirkland, a senior systems analyst at South Carolina Electric & Gas in Columbia.

Other changes are expected, given Lotus' lackluster sales in the international arena, an increasingly critical revenue source for many U.S. companies. For example, Wall Street analysts said they expect Lotus to execute layoffs in its international business group.

Conversely, Lotus Chief Executive Officer and President Jim Manzi insisted that Lotus had no plans for layoffs. However, he acknowledged that European sales have been weak. Manzi also said Lotus needed to improve efforts to provide "a single face" to users worldwide.

Separately, internal Lotus sources said the recent discontinuation of development for some desktop products, coupled with a hiring freeze, have already resulted in the equivalent of layoffs.

Lagging on the desktop

The Lotus shake-up arrives on the heels of the firm's second quarter, during which delivery of major desktop products slipped into the third quarter.

Also, Lotus officials acknowledged that they had lost more ground to Microsoft Corp. in the suite market during the quarter.

"The desktop group is still profitable, but they are seeing better margins in the communications business," said Timothy McCollum, an analyst at Dean Witter Reynolds, a Wall Street investment bank.

By emphasizing communications products, Lotus may stand a better chance of grabbing new desktop sales, analysts said. Notes sites are 10% to 15% more likely to buy the Lotus suite than non-Notes sites. But Notes shops still primarily use Microsoft suites, they added.

"Notes is Notes and suites is suites," said Terrence McCarthy, managing director of Neoteric, Inc. in New York. "I think people are content to get Notes from Lotus and suites from Microsoft."

Analysts said Lotus clearly must improve its presence in the international market, where it has been clobbered by Microsoft. Lotus is now generating only 50% of its revenue from the international market, said Paul Johnson, an analyst at Robertson, Stephens, a Wall Street investment bank. The industry norm is 60%, he said.

Further focusing its product efforts, Lotus is pruning its development activities for desktop applications to focus on Windows and OS/2-based applications. Two Lotus sources said no meaningful development for Lotus' 1-2-3 for DOS spreadsheet is planned or under way.

However, a Lotus spokesman, noting that the business has been profitable, said it has not yet determined whether it will terminate DOS 1-2-3 development.

If Lotus goes forward with dropping the DOS-based spreadsheet, it will mean that it has completely eliminated its DOS-based and Macintosh-based desktop product line.

Trading places

The latest Lotus reorganization follows a shuffle in the desktop applications division executed earlier this year.

Last week, to address Lotus' fading position in the area, June Rokoff, a reputed fix-it manager, was put in charge of the desktop applications business. Officials acknowledged that during the last quarter, Lotus lost two to three percentage points to Microsoft in the applications suite market.

Also as part of the management shuffle, John Landry, who formerly managed all development, will now focus on communications, which most analysts view as more strategic to Lotus over the long haul.

Currently, Lotus pulls in 35% of its revenue from communications products such as Notes and CC:Mail, while 65% of its revenue is derived from desktop applications. — *William Brandel*

Unicenter cuts

CONTINUED FROM PAGE 1

CA-Unicenter to manage its Hewlett-Packard Co. HP/UX environment for the past year.

The steep price cuts are not expected to have a negative impact on CA's Unicenter revenue, which topped $100 million for the first half of 1994.

Rather, analysts speculated the discounts could generate new business for CA and could drive up its Unicenter revenue by an additional 20% to 30%.

The price reductions represent a significant shift in posture for the $2.1 billion vendor, industry observers noted. "When we spoke to [CA] in March, they said their strategy was to charge a premium price and go after the mainframe crowd. Unicenter pricing was definitely too high to [sell] beyond the mainframe-centric crowd," said Jonathan Eunice, research director at Illuminata, a consultancy in Hollis, N.H.

Seibert denied CA had been overpricing CA-Unicenter. The price cuts are "an admission that we missed a particular market segment," said Seibert, referring to the smaller customers CA is trying to attract.

Savings sought

Some customers saw the price cuts as an opportunity to reduce their information systems expenses.

"We'll probably follow up with CA on pricing. I was told that we got the deal of the century on the software when we bought it [in 1993], but I plan on talking to our people who were involved with the purchase," said Dave Barricks, a technical support specialist at Chesebrough-Ponds USA in Trumbull, Conn., another CA-Unicenter for HP/UX site.

Associated Grocers' Richard Lester *plans to talk to HP about OpenView pricing due to Unicenter cuts*

Analysts said the massive Unicenter price cuts will help the Islandia, N.Y., software mammoth gobble up a chunk of the emerging market for entry-level client/server systems management.

"The initial cost to get Unicenter was $75,000 to $100,000, and that's an awfully big pill for little companies to swallow," said William Gannon Jr., vice president of research at Sentry Market Research, Inc. in Westboro, Mass. However, CA's price drops will allow smaller customers to "buy the whole Swiss Army knife for the cost of a single tool," added Peter Kastner, a vice president at Aberdeen Group in Boston.

That might spell bad news for niche vendors such as Operations Control Systems (OCS), a Palo Alto, Calif., developer of point solutions such as Express for Unix, an automated job scheduling package designed for HP/UX.

The entire Unicenter suite — which touts nearly a dozen systems management functions such as tape management and security — is now closer in price to a single scheduling package such as Express for Unix. But OCS executives said they do not feel threatened. "We figured [CA] would eventually have to lower" its prices, said Jim Löfink, OCS' director of marketing.

"If we had lost more business to them [CA], I would feel threatened," said Pete Privateer, senior vice president of operations at Axent Technologies, a division of Raxco that markets security products for client/server environments.

Other CA competitors insisted that users do not select systems management products — critically important in a distributed client/server environment — based on price alone.

"Our customers have never had an issue with paying a fair price for superior technology," said Michael Fields, chairman and chief executive officer at OpenVision in Pleasanton, Calif., in a prepared statement. "Obviously, CA is value-pricing again."

Still, by radically lowering the costs of distributed systems management software, CA could draw competitors such as OpenVision and Tivoli Systems, Inc. into a price war.

"Our decision to go with OpenView was based primarily on the openness of the solution," said Richard Lester, vice president of information services at Associated Grocers, Inc. in Seattle. "But I believe the Unicenter price cuts will lead us to enter into discussions with HP about pricing on OpenView."

Chasing CA customers

While Computer Associates was busy trying to conquer the burgeoning distributed systems management market last week, Software AG of North America, Inc. made a determined pitch to wrest away its CA-Ingres relational database management system users.

In an uncharacteristically aggressive move, the Reston, Va.-based systems software vendor announced a dollar-for-dollar discount — worth up to $100,000 for CA-Ingres users — in an attempt to lure them to its Adabas D Rdbms environment.

Software AG officials said they want to use the discount to jump-start Adabas D in the Rdbms server market. They contended that Ingres customers are tired of repeated product delays and are fearful of CA. Ingres, previously owned by The ASK Group, Inc., was acquired by CA in June.

"Clearly, [Ingres users] are concerned with what is going to happen with them," said Mike Schiff, Software AG's director of data management. "We are privately held. No matter what happens to us, you know that your maintenance bill will not come from Islandia," the New York headquarters of CA, Schiff added.

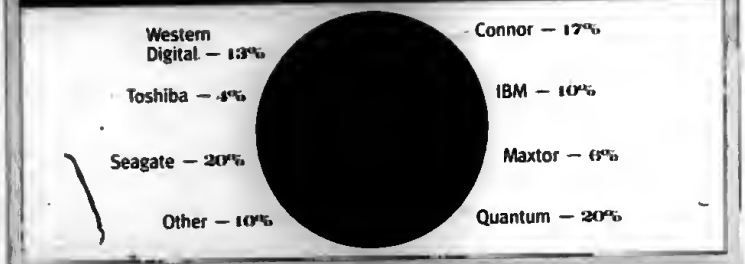
CA officials scoffed at Software AG's overtures to its CA-Ingres customers. The offer "sounds like a last-ditch effort on the part of Software AG," said Kurt Seibert, CA's senior vice president of business strategy.

One CA-Ingres developer said he was unmotivated by Software AG's offer. "We have so much work invested in the coding of our software that a dollar-to-dollar offer is meaningless," said Bill Menger, a database consultant and CA-Ingres user at Conoco, Inc. in Houston. — *Thomas Hoffman and Rosemary Cafasso*

INDUSTRY PULSE: Storage

QUANTUM AND SEAGATE LEAD THE ESTIMATED $18B HARD DRIVE MARKET THAT IS SLOWLY TURNING TO LAN SERVERS AS ITS NEXT GROWTH SECTOR.

Projected 1994 market share for hard drive manufacturers



Hard drive market revenue by platform (in billions)

Mobile	$1.2	$1.5	$1.9	$2.4	$2.7	$2.9
Desktop	$7.5	$7.4	$8.6	$8.9	$9.7	$10.4
Workstation	$0.4	$0.5	$0.5	$0.6	$0.7	$0.7
LAN server	$1.2	$1.5	$2.1	$2.8	$3.4	$4.0
Multiuser	$2.3	$3.2	$4.7	$5.2	$5.8	$7.0

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CD-ROM drive market

Source: International Data Corp., Framingham, Mass. *Projected

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Inside Lines

Still on hold . . .

The Open Software Foundation (OSF) has yet to give a formal go-ahead to merge the Common Open Software Environment's Common Desktop Environment (CDE) with the OSF/Motif GUI. That merger — promised 18 months ago — is supposed to produce a "common Unix dashboard" GUI for Unix boxes from IBM, Hewlett-Packard, Sun and other vendors. Yet most of the vendors are still futzing with their formal requests for OSF funding. In the meantime, SunSoft and The Santa Cruz Operation are already promising CDE for 1995, and IBM has said it will bundle an initial version of CDE support into AIX 4.1. Anybody feel the Earth move?

The power of sub

Move over Compaq and IBM — a new notebook rival has joined the fray. Known since just about the dawn of computing for its mainframes alone, Unisys will make its splash in the mobile computing market next month when it begins marketing a 5-pound laptop. Although officials at the Blue Bell, Pa., vendor are not divulging details about pricing, a spokesman placed the notebook's value within 20% of comparable 75-MHz Intel 486DX4-based machines.

LANs and WANs at play

Newport Systems Solutions next week will make its first announcement as the newly acquired PC Access business unit of Cisco Systems, according to sources close to Newport. The Irvine, Calif., firm will unveil a multiprotocol routing software architecture that enables developers to make LAN and WAN communications and network management applications interoperable. Lan Intelligence, Vinca Corp. and Xnet Technology will incorporate the technology in their remote-access products, the sources said.

West Coast CICS-off coming

HP plans to introduce its production version of IBM's Unix-based CICS/6000 transaction processing software in the fourth quarter. HP has had an early release of the software available for customer evaluations since June, but it is based on the rather poky first version of CICS/6000. The new production code will use a faster CICS/6000 release that was delivered this summer, and HP said it will upgrade to a promised third version shortly after IBM makes it available late this year or early in 1995. HP calls the software CICS/9000 to link it with the HP 9000 server line.

Another carrot from IBM's garden

IBM is expected to allow older versions of MVS to run on new CMOS-based mainframes, which are scheduled for introduction in mid-September. But industry sources last week said the computer giant will also offer special pricing deals to entice buyers to upgrade to the upcoming MVS 5.2. Users who opt to keep their older MVS releases, however, will continue paying maintenance fees under IBM's traditional, more costly tiered pricing structure.

Candle in the Windows

Candle and Microsoft are expected to present a proposal at the Object Management Group (OMG) meeting in Dublin next week that may go far toward resolving incompatibilities between conflicting object models. Developers have raised concerns about the disparity between the OMG's CORBA and Microsoft's OLE. The proposal might just offer a way to integrate CORBA with OLE's object model, industry sources said.

Just when you thought those buttoned-up engineers at HP had left their Woodstock days behind, along comes an item in the San Jose Mercury News *last week headlined "HP snuffs out a little worker initiative." Seems that along with HP's profits, other things are growing out there. HP security officers found 120 or so marijuana plants thriving in a thicket in a remote part of the Santa Rosa, Calif., facility . . . To get in touch with* Computerworld *about news items or tips, call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179, via the Internet at mjohnson@cw.com or through MCI Mail at 590-8017.*

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